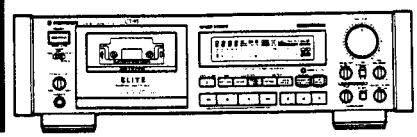
PIONEER®
*The Art of Entertainment*

# *Service Manual*



ORDER NO.
**ARP2227**

## STEREO CASSETTE DECK

# CT-S709
# CT-676
# CT-676-S

### CT–S709, CT–676 AND CT–676–S HAVE THE FOLLOWING:

| Type | Model | | | Power Requirement | Remarks |
|---|---|---|---|---|---|
| | CT–S709 | CT–676 | CT–676–S | | |
| KU/CA | ○ | – | – | AC120V only | |
| HEM | – | ○ | – | AC220V–230V, 230V–240V (switchable) * | |
| HB | – | ○ | – | AC220V–230V, 230V–240V (switchable) * | |
| SD | – | ○ | – | AC110V, 120V–127V, 220V, 240V (switchable) | |
| HEWM | – | – | ○ | AC220V–230V (switchable) * | |

* Change the primary wiring of the power transformer.

- **This manual is applicable to the CT–S709/KU/CA, CT–676/HEM, HB, SD and CT–676–S/HEWM types.**
- **As to the CT–676/HEM, HB, SD and CT–676–S/HEWM types, refer to page 43–44.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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**This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.**
**Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.**

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

# 1. SAFETY INFORMATION

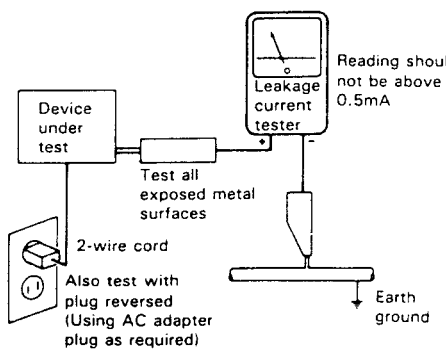
(FOR USA MODEL ONLY)

### 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

**LEAKAGE CURRENT CHECK**

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

**ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

### 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

# 2. DISASSEMBLY

1. Remove the bonnet.
2. Remove the three screws ① and take out the FL shield plate. (Fig. 2–1)
3. Remove the upper screw ② and lower three screws ②, then take out the front panel. (Fig. 2–1)
4. Turn the power ON. (Fig. 2–1)
5. Open the cassette door by pressing the open/close button. (Fig. 2–1)
6. Remove the cassette cover and cassette door by pressing the two claws. (Fig. 2–1)

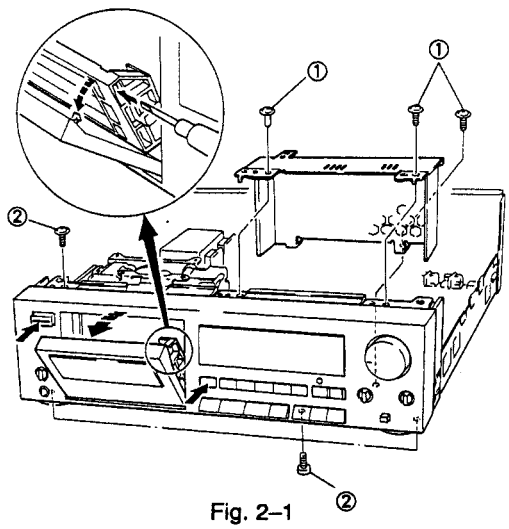



Fig. 2–1

7. Close the cassette door by pressing the close button.
8. Remove the springs at both sides of the cassette cover. Do not touch the end of spring to the cassette mechanism.
9. Remove the hook of the panel stay and take out the cassette door. (Fig. 2–2)
10. Remove the four screws ③ of the panel stay and two screws ④ on the chassis side, then take out the cassette mechanism unit. (Fig. 2–2)

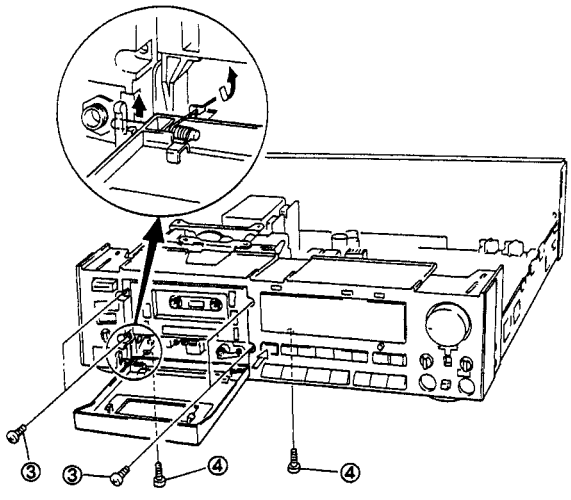



Fig. 2–2

## ● Removal of door

Pull and remove the door by pushing the claw indicated by the arrow in the figure.
(The claw forms hook shape as in SEC A to A. Do not touch the claw to other parts when pushing.)
The claw is symmetrical in configuration.

## ● Mounting of door

Open the door and strongly nip the claw and pocket so that the claw is hooked on the pocket.

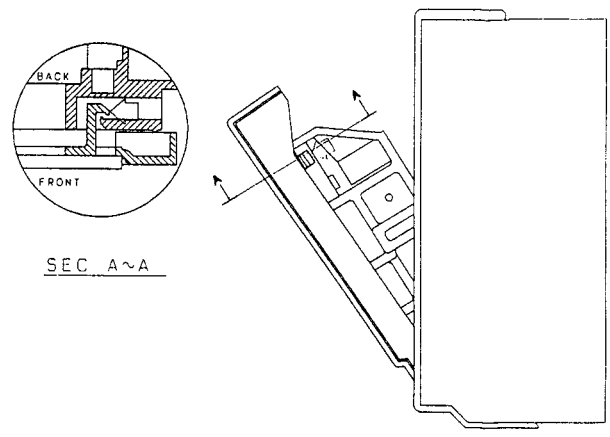



Fig. 2–3

# 3. EXPLODED VIEWS, PACKING AND PARTS LIST

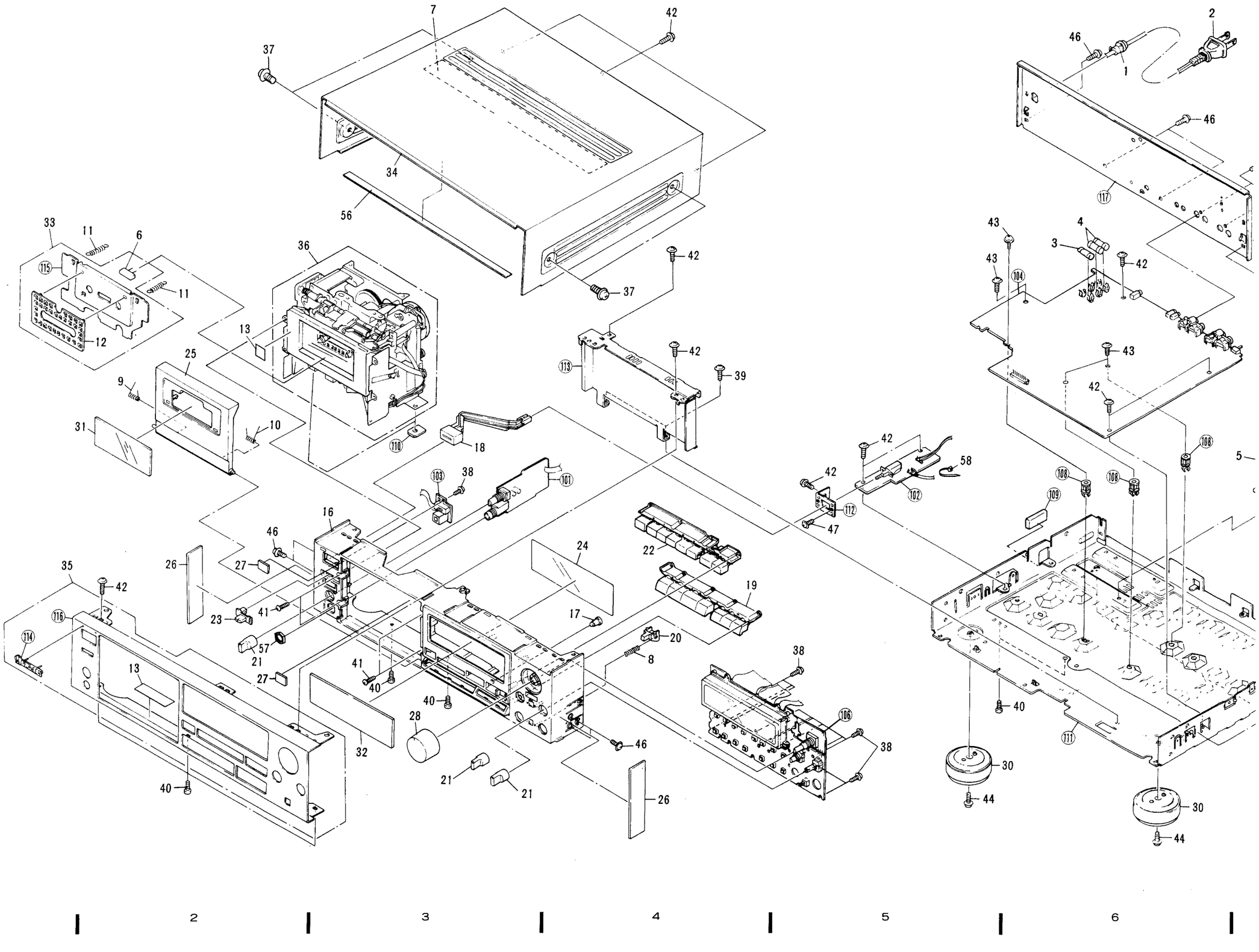
NOTES:

- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

## 3.1 PARTS LIST OF EXTERIOR AND PACKING

| Mark | No. | Description | Part No. |
|---|---|---|---|
| ⚠ | 1 | Strain relief | CM – 22C |
| ⚠ | 2 | AC Power cord | PDG1015 |
| ⚠ | 3 | FU703 Fuse (1.6A) | REK – 074 |
| ⚠ | 4 | FU701, FU702 (500mA) | REK – 077 |
| ⚠ | 5 | T1 Power transformer | RTT1159 |
| | 6 | Diode | SLF – 401C |
| | 7 | Absorb plate (B) | PNB1109 |
| | 8 | Door spring | RBH1144 |
| | 9 | Door spring (L) | RBH1259 |
| | 10 | Door spring (R) | RBH1260 |
| | 11 | Earth spring | RBL – 059 |
| | 12 | Stablizer (B) | REB1038 |
| | 13 | Door cushion | REB1167 |
| | 14 | Spacer | REC1086 |
| | 15 | Cord clamper | RNH – 184 |
| | 16 | Panel stay | RNT1090 |
| | 17 | Counter reset knob | RAA1009 |
| | 18 | Power button | RAC1410 |
| | 19 | Function knob | RAC1411 |
| | 20 | Push knob | RAC1413 |
| | 21 | Knob (B) | RAC1414 |
| | 22 | Mode knob | RAC1552 |
| | 23 | Slide SW knob | RAC1562 |
| | 24 | FL filter | RAH1838 |
| | 25 | Door | RAH1846 |
| | 26 | Side rubber | REB1094 |
| | 27 | Door sheet | REB1170 |
| | 28 | VR knob assembly | RXA1281 |
| | 29 | Stopper | VEC1061 |
| | 30 | Insulator | VNK1095 |
| | 31 | Door lens | RLP1026 |
| | 32 | FL lens | RLP1027 |
| | 33 | Cassette plate assembly | RXX1115 |
| | 34 | Bonnet | RXX1378 |
| | 35 | Front panel assembly | RXX1388 |
| ⊙ | 36 | Mechanism unit | RYM1124 |
| | 37 | Screw | FBT40P080FZK |
| | 38 | Screw | ABZ26P080FZK |
| | 39 | Screw | BBT30P060FCC |
| | 40 | Screw | BBT30P100FZK |
| | 41 | Screw | BBZ30P100FZK |
| | 42 | Screw | IBZ30P060FCC |
| | 43 | Screw | IBZ30P100FCC |
| | 44 | Screw | IBZ30P080FCC |
| | 45 | Screw | BBZ30P100FCC |
| | 46 | Screw | BBZ30P060FZK |
| | 47 | Screw | PMA30P060FCU |
| | 48 | Pad (F) | RHA1021 |
| | 49 | Pad (R) | RHA1022 |
| | 50 | Packing case | RHG1282 |
| | 51 | Sheet | RHX – 034 |
| | 52 | Control cord | RDE1030 |
| | 53 | Connection cord (with mini plug) | PDE – 319 |
| | 54 | Connection cord | RDE1002 |
| | 55 | Operating instructions | RRB1094 |
| | 56 | Protector | RED1020 |
| | 57 | Jack nut | RBN – 006 |
| | 58 | Binder | REC – 371 |
| | 101 | HPHN unit | |
| | 102 | PWSW unit | |
| | 103 | TIMS unit | |
| | 104 | MAIN unit | |
| | 105 | TRN 2 unit | |
| | 106 | SUBB unit | |
| | 107 | Connector assembly (2P) | |
| | 108 | PCB spacer | |
| | 109 | Rubber spacer (A) | |
| | 110 | Mechanism sheet (2) | |
| | 111 | Main chassis | |
| | 112 | PS holder | |
| | 113 | FL shield plate | |
| | 114 | Name plate | |
| | 115 | Cassette plate | |
| | 116 | Front panel | |
| | 117 | Rear panel | |
| | 118 | Connection cord assembly | |
| | 119 | TRN 1 unit | |

## Exterior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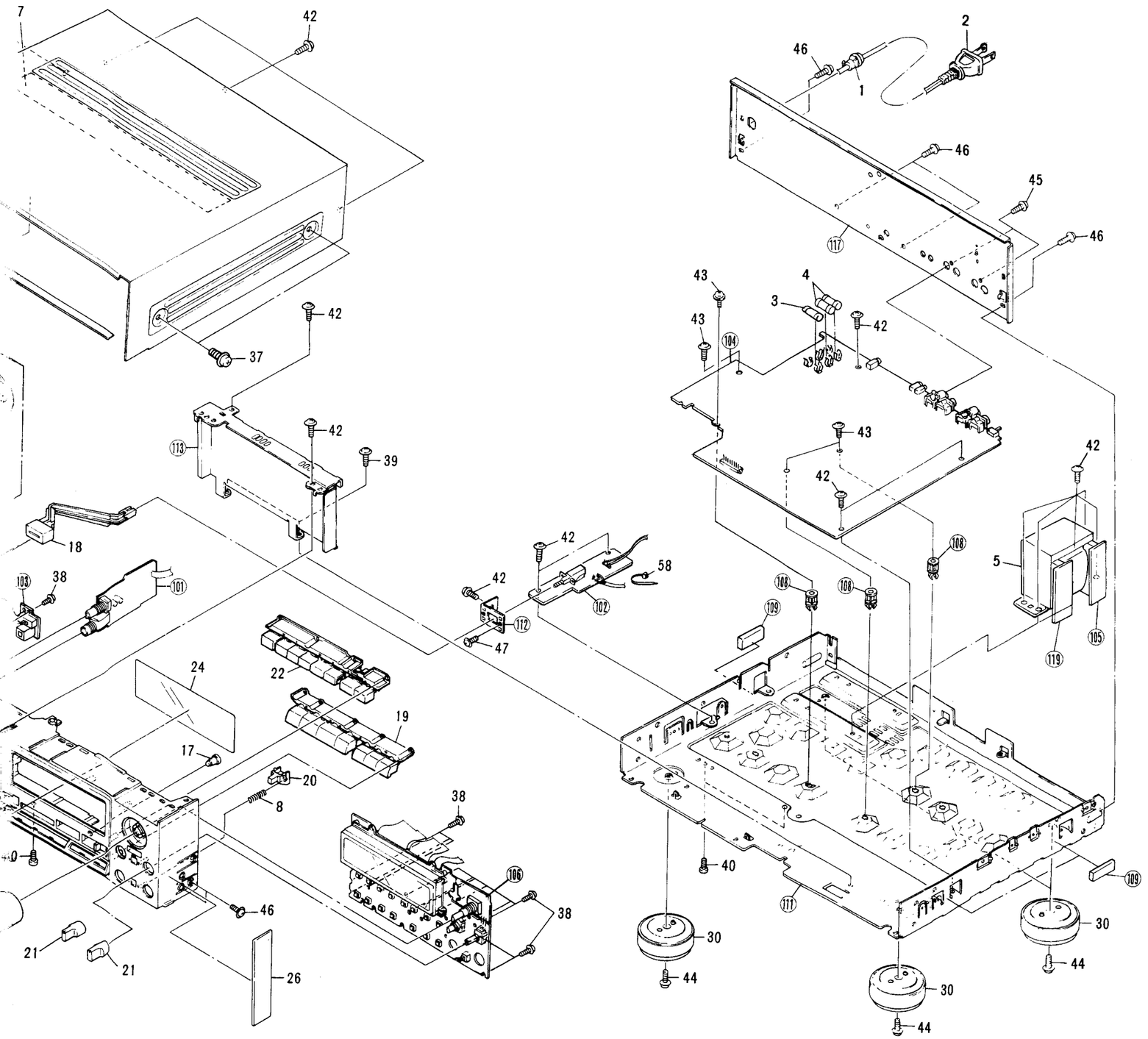
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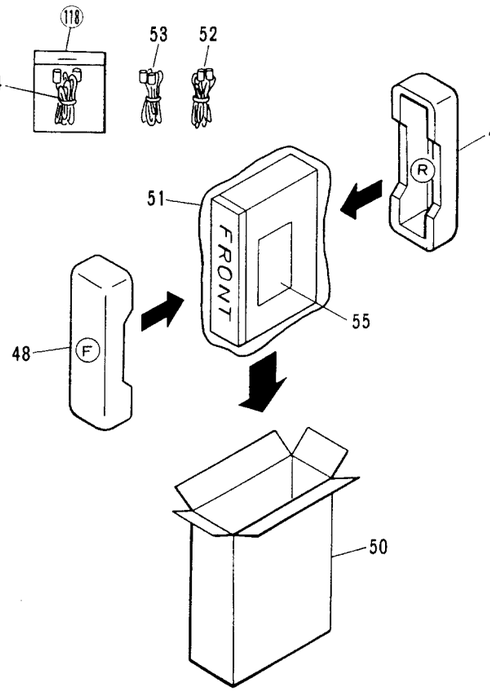
Packing
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FRONT
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## 1.2 MECHANISM UNIT

### Parts List of Mechanism Unit

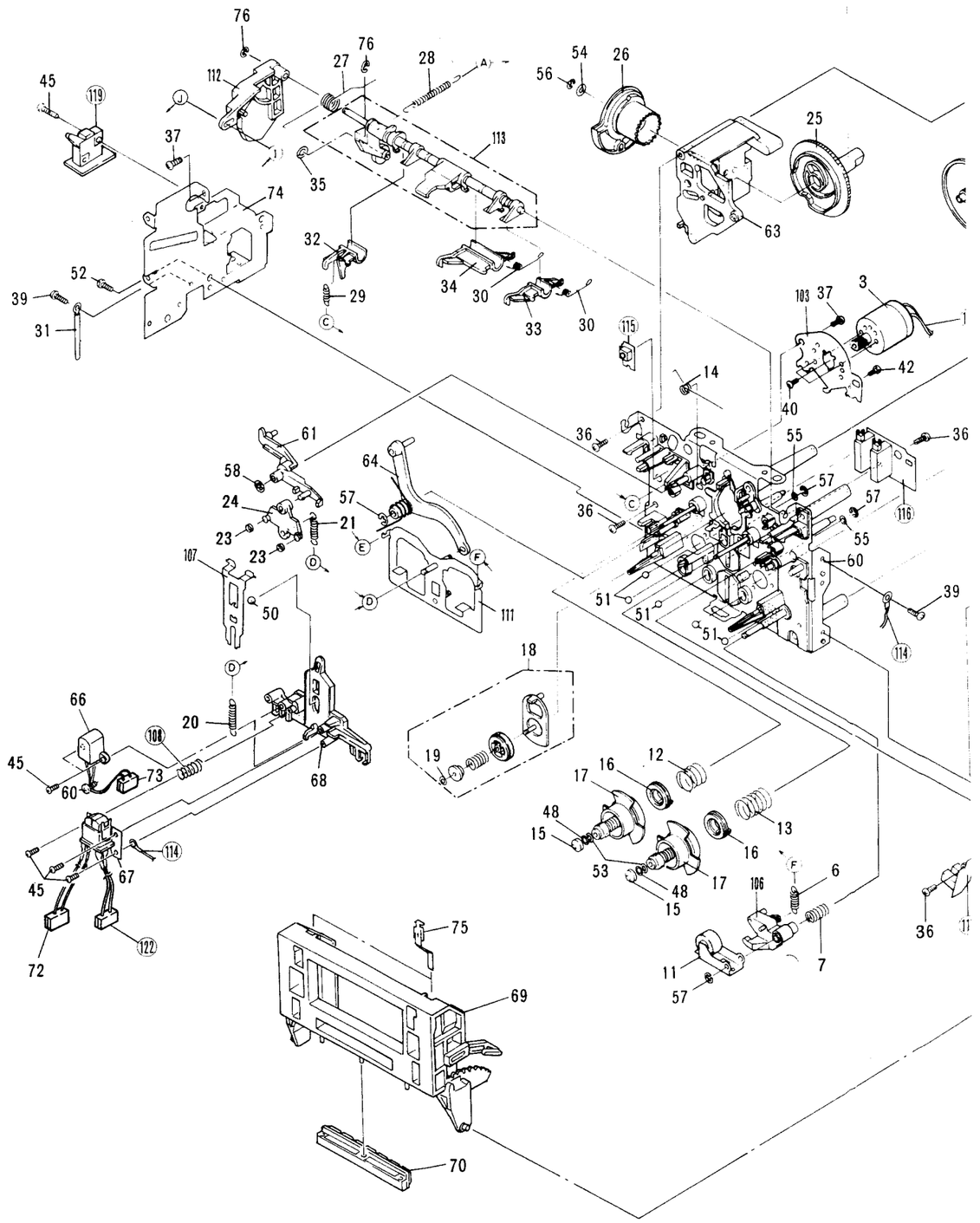
| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Rotary encoder | RSX1004 |
| | 2 | Capstan motor | RXM1036 |
| | 3 | Reel motor assembly | RXM1018 |
| | 4 | Step screw | RBA – 064 |
| | 5 | Rubber cushion | REB1125 |
| | 6 | Pinch spring | RBL – 028 |
| | 7 | Pinch thrust spring | RBL – 030 |
| | 8 | Capstan belt | REB1143 |
| | 9 | Flywheel assembly | RXA1374 |
| | 10 | Metal holder assembly(A) | RXA1342 |
| | 11 | Pinch roller arm (R) assembly | RXB – 876 |
| | 12 | BT spring (A) | RBL – 031 |
| | 13 | BT spring (B) | RBL – 032 |
| | 14 | Idler pressure spring | RBL – 033 |
| | 15 | Reel shaft cap (B) | RNK – 815 |
| | 16 | BT disc assembly | RXB – 751 |
| | 17 | Reel base assembly | RXB – 874 |
| | 18 | Take – up idler assembly | RXB – 875 |
| | 19 | Washer | RBF – 065 |
| | 20 | Head base spring | RBL – 037 |
| | 21 | Brake spring | RBL – 038 |
| | 22 | Drive belt | REB1169 |
| | 23 | Brake shoe | REB – 511 |
| | 24 | Brake | RNL – 723 |
| | 25 | Cam gear | RNK1640 |
| | 26 | Side cam gear assembly | RXA1349 |
| | 27 | Eject spring | RBL – 039 |
| | 28 | Half pressure spring | RBL – 040 |
| | 29 | REC arm spring | RBL – 041 |
| | 30 | Detect arm spring | RBL – 042 |
| | 31 | Cord clamper | RNH – 184 |
| | 32 | REC detect arm | RNL – 733 |
| | 33 | $CrO_2$ detect arm | RNL – 734 |
| | 34 | Metal detect arm | RNL – 735 |
| | 35 | Washer | RBF – 057 |
| | 36 | Screw | BBZ26P080FZK |
| | 37 | Screw | BBZ30P080FZK |
| | 38 | Screw | PMB20P060FMC |
| | 39 | Screw | BCZ30P060FMC |
| | 40 | Screw | BMZ26P030FZK |
| | 41 | Screw | PBZ20P060FMC |
| | 42 | Screw | BMZ30P080FZK |
| | 43 | Screw | JGZ20P025FMC |
| | 44 | Screw | PMA26P050FZK |
| | 45 | Screw | PMZ20P080FZK |
| | 46 | Washer | RBF – 030 |
| | 47 | Thrust washer (A) | RBF – 069 |
| | 48 | Washer | RBF – 076 |
| | 49 | Binder | REC – 371 |
| | 50 | Steel ball ($\phi$ 3) | REF – 022 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 51 | Steel ball ($\phi$ 4) | REF – 023 |
| | 52 | Screw | VCT30P060FZK |
| | 53 | Washer | WA21D040D013 |
| | 54 | Washer | WA26N070W040 |
| | 55 | Washer | WA32D080D050 |
| | 56 | E ring | YE20FUC |
| | 57 | E ring | YE25FUC |
| | 58 | Washer | YS24FBT |
| | 59 | Power motor assembly | RXX1055 |
| | 60 | Mechanism chassis assembly | RXA1422 |
| | 61 | Brake lever | RNK1638 |
| | 62 | Second pulley assembly | RXA1350 |
| | 63 | Gear base assembly | RXA1351 |
| | 64 | Pinch lever assembly | RXA1360 |
| | 65 | Capstan motor assembly | RXX1334 |
| | 66 | E head | RPB1002 |
| | 67 | R/P head | RPB1044 |
| | 68 | Head base | RNK1727 |
| | 69 | Door pocket | RNT1101 |
| | 70 | Stabilizer | REB1161 |
| | 71 | Damper assembly | REC1005 |
| | 72 | Connector assembly (4P) | RKP1383 |
| | 73 | Connector assembly (2P) | RKP1384 |
| | 74 | Door frame (L) | RNE1442 |
| | 75 | Half pressure spring | RBK1004 |
| | 76 | E ring | YE30FUC |
| | 77 | Pinch return spring | RBH1299 |
| | 101 | Connector unit | |
| | 102 | Power motor | |
| | 103 | Reel motor mounting plate | RNE1169 |
| | 104 | Flywheel holder | RNH – 304 |
| | 105 | Thrust holder | RNL – 743 |
| | 106 | Pressure arm (R) | RNL – 725 |
| | 107 | Head base pressure spring | RBL – 026 |
| | 108 | Head adjust spring (C) | |
| | 109 | First pulley | |
| | 110 | Gear chassis assembly | RXA1171 |
| | 111 | Pinch base assembly | RXB – 878 |
| | 112 | Eject lever | RNL – 738 |
| | 113 | Shift shaft assembly | RXB – 885 |
| | 114 | Earth lead assembly | |
| | 115 | REC switch unit | |
| | 116 | Tape selector unit | |
| | 117 | Sensor unit (A) | |
| | 118 | Motor pulley | |
| | 119 | Door switch unit | |
| | 120 | 2.5mm pich side post (5P) | |
| | 121 | Vinyl wire (2P) | |
| | 122 | Connector assembly (4P) | |
| | 123 | Door frame (R) | |

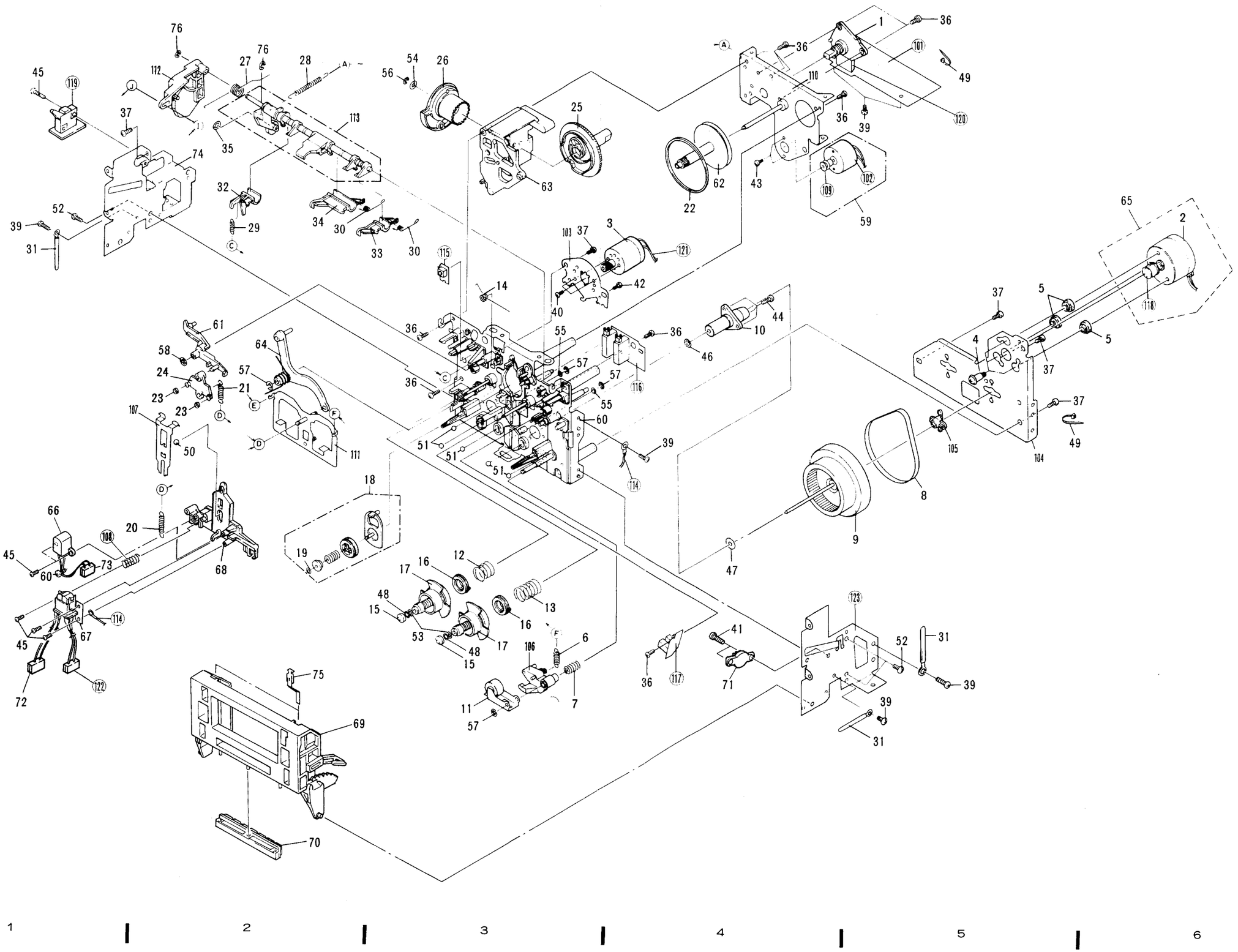




### Parts List of Mechanism Unit



# Parts List of Mechanism Unit



12 11 10 9 8 7

A

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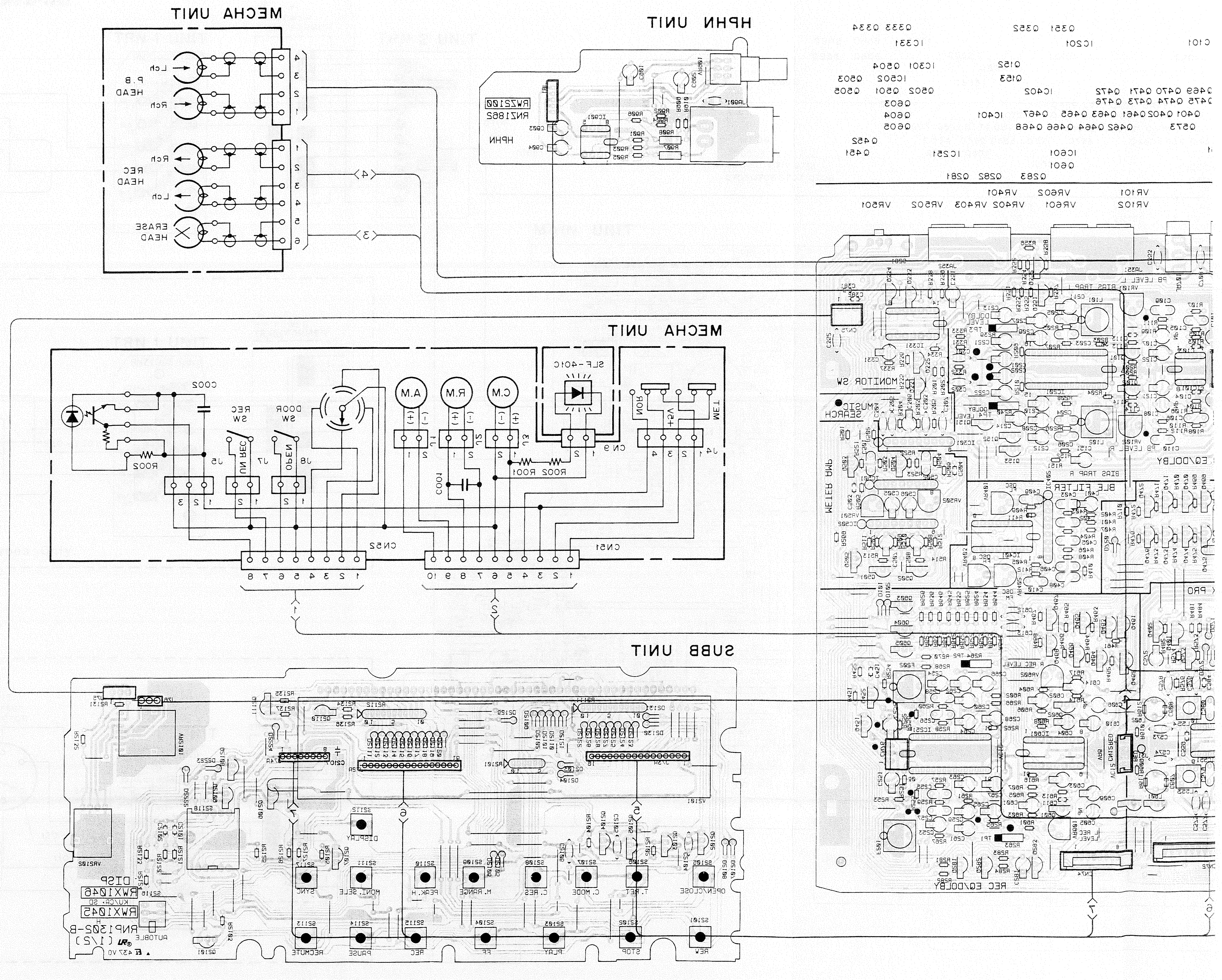
C

D


MECHA UNIT
P.B HEAD
REC HEAD
ERASE HEAD
Lch
Rch
HPHN UNIT
RWZ2100
RNZ1862
HPHN
MECHA UNIT
SLF-401C
C002
C001
REC SW
DOOR SW
UN REC
OPEN
R002
R001
C.M
R.M
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SUBB UNIT
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VR601
VR402 VR403
VR502
VR501
MONITOR SW
MUSIC SEARCH
METER AMP
DOLBY LEVEL
PB LEVEL L
PB LEVEL R
BIAS TRAP L
BIAS TRAP R
BLE FILTER
EQ/DOLBY
R REC LEVEL
L REC LEVEL
REC EQ/DOLBY
PRO

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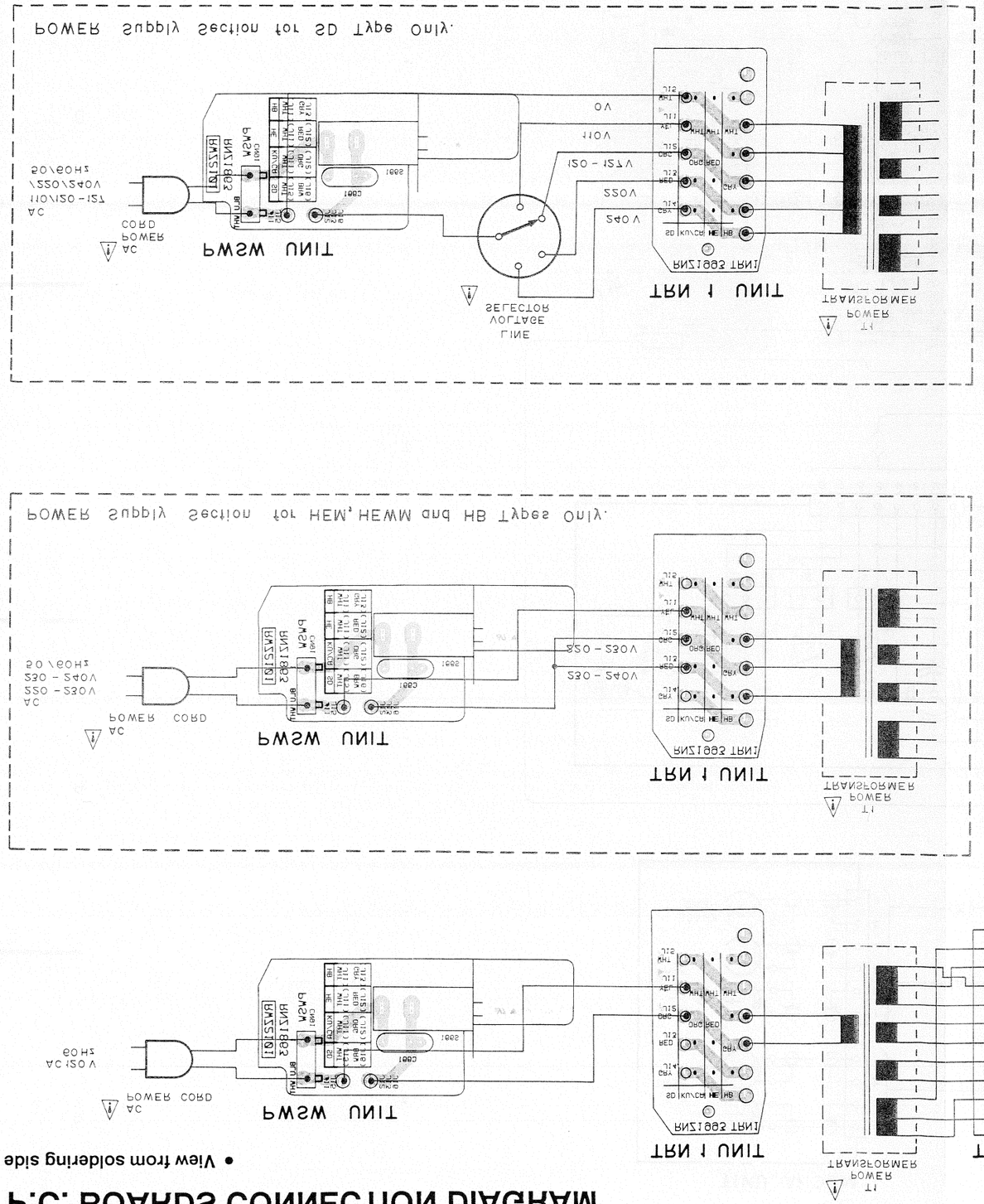
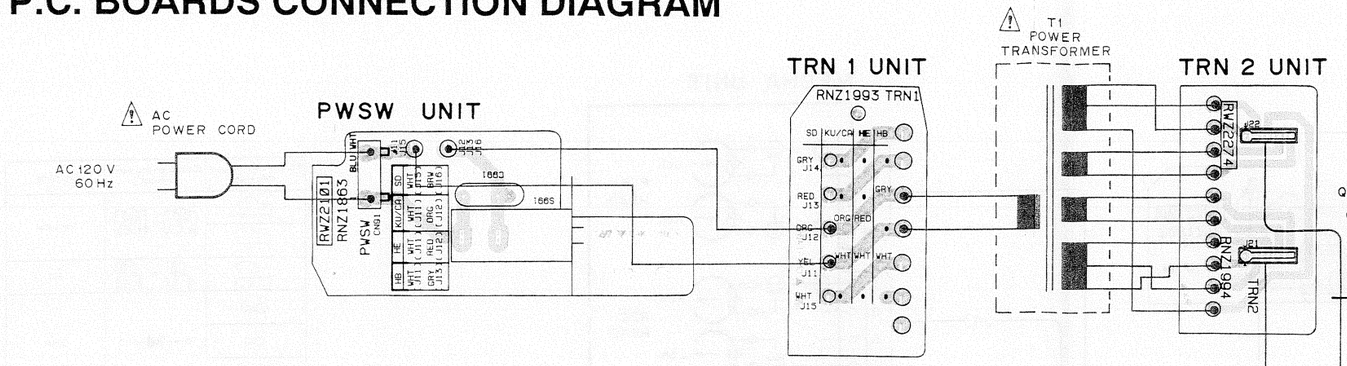
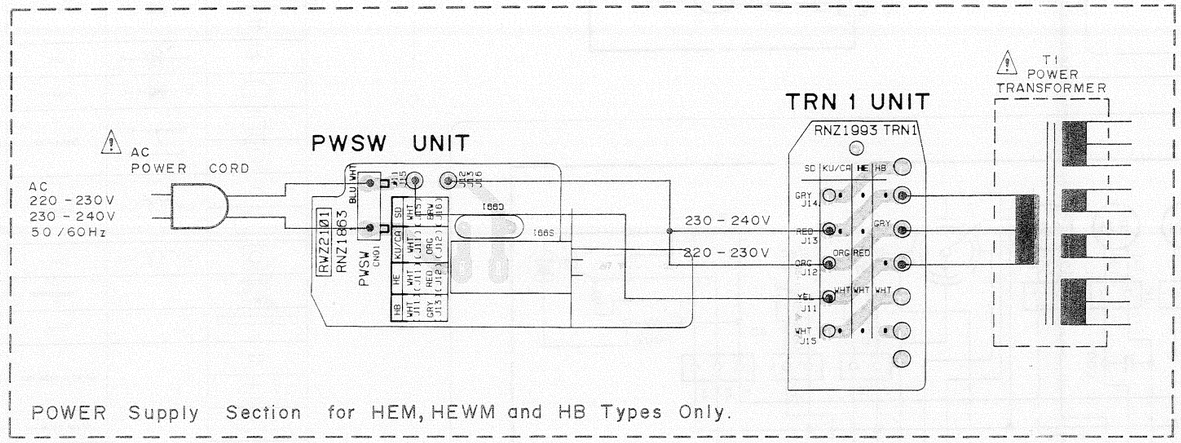
## 4. P.C. BOARDS CONNECTION DIAGRAM

• View from soldering side

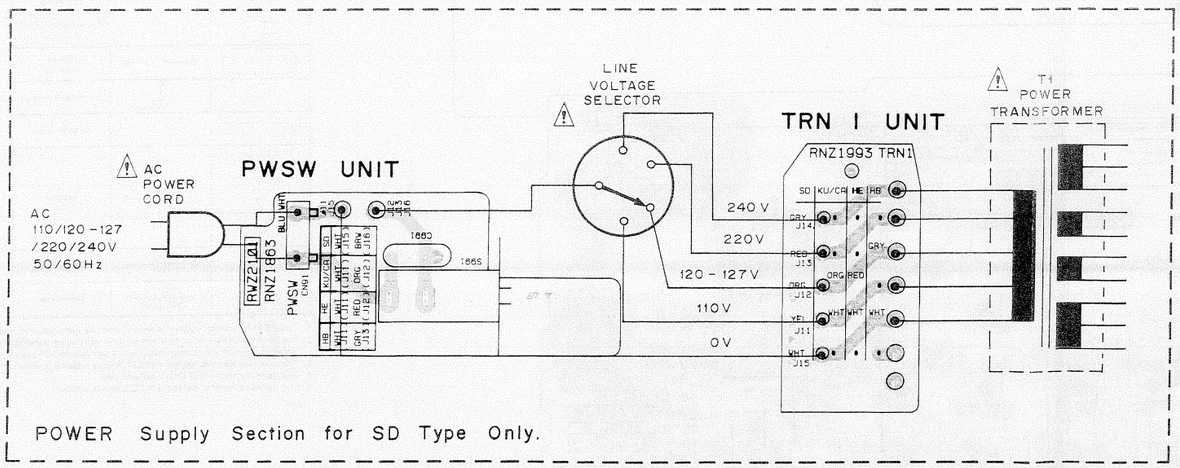


# 4. P.C. BOARDS CONNECTION DIAGRAM

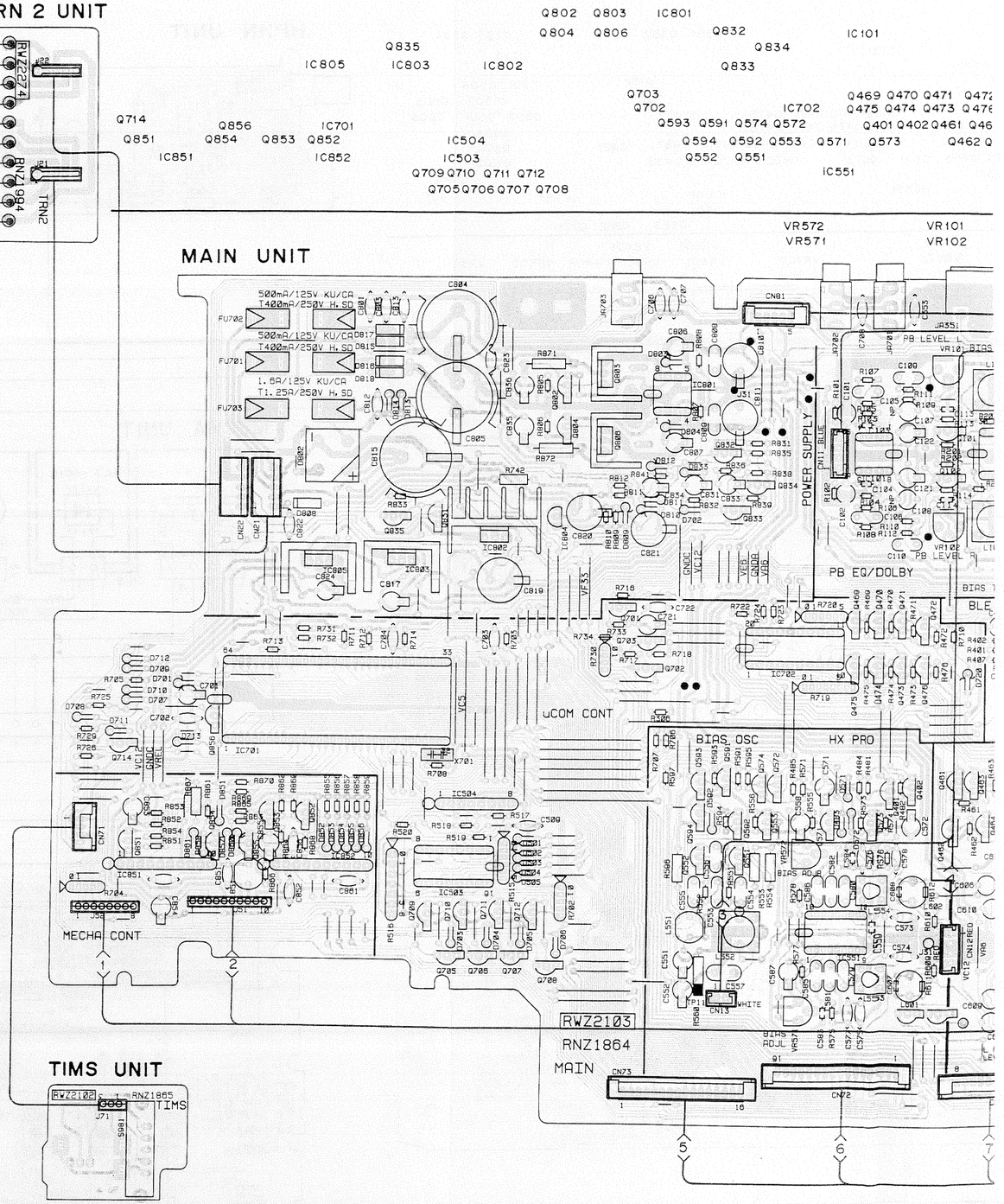


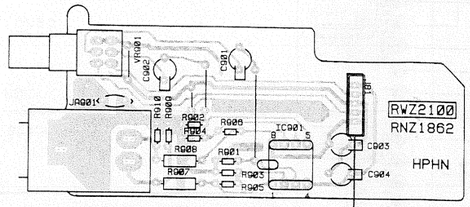

POWER Supply Section for HEM, HEWM and HB Types Only.



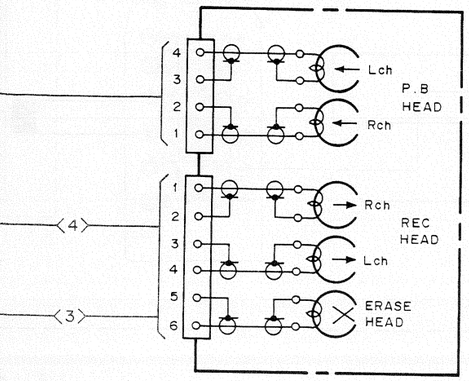

POWER Supply Section for SD Type Only.



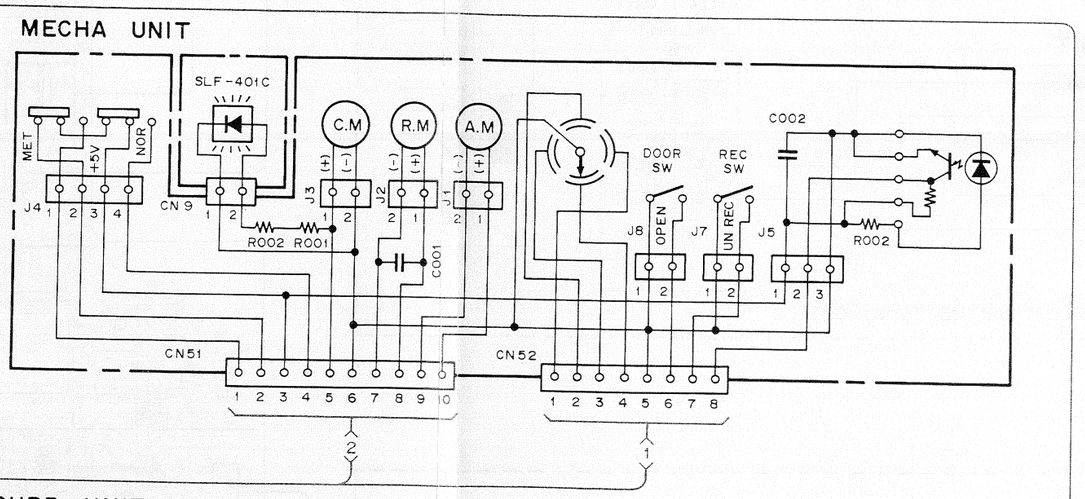
## HPHN UNIT



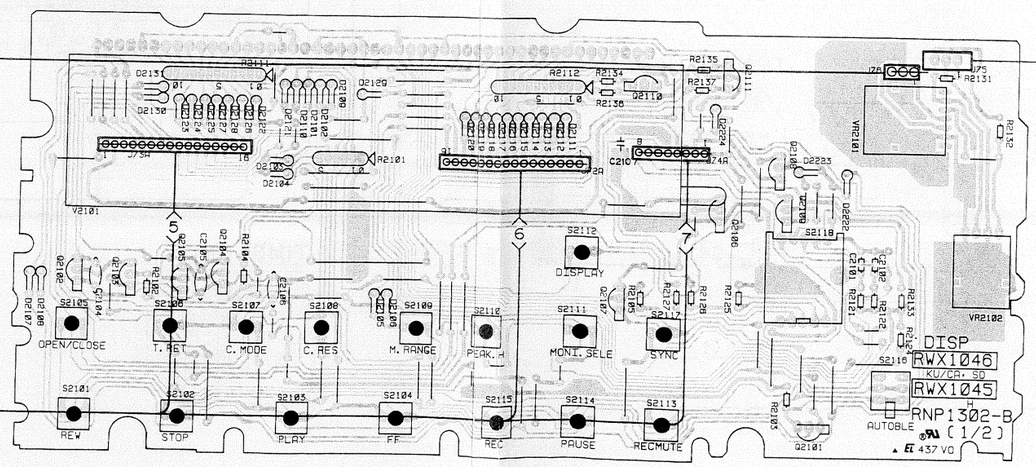

## MECHA UNIT

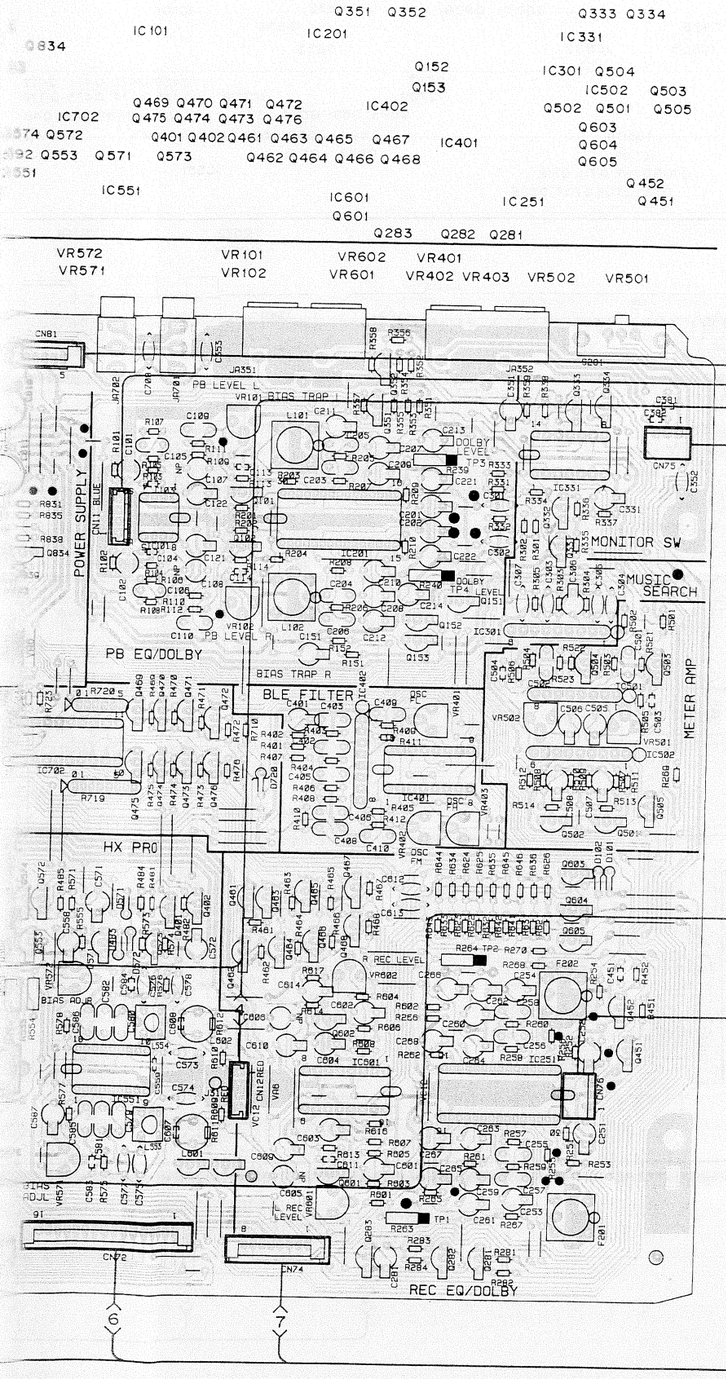



## MECHA UNIT




## SUBB UNIT

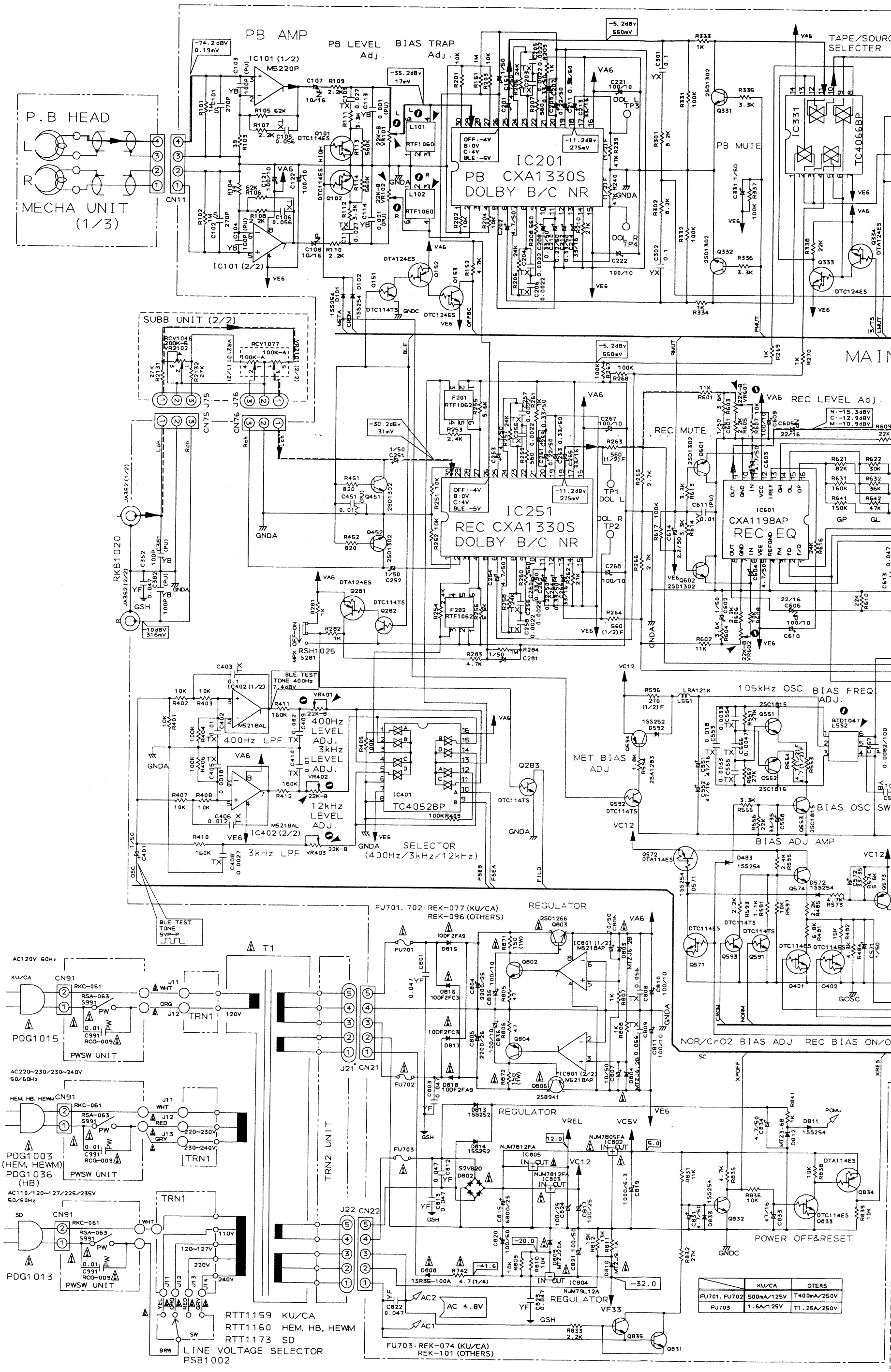


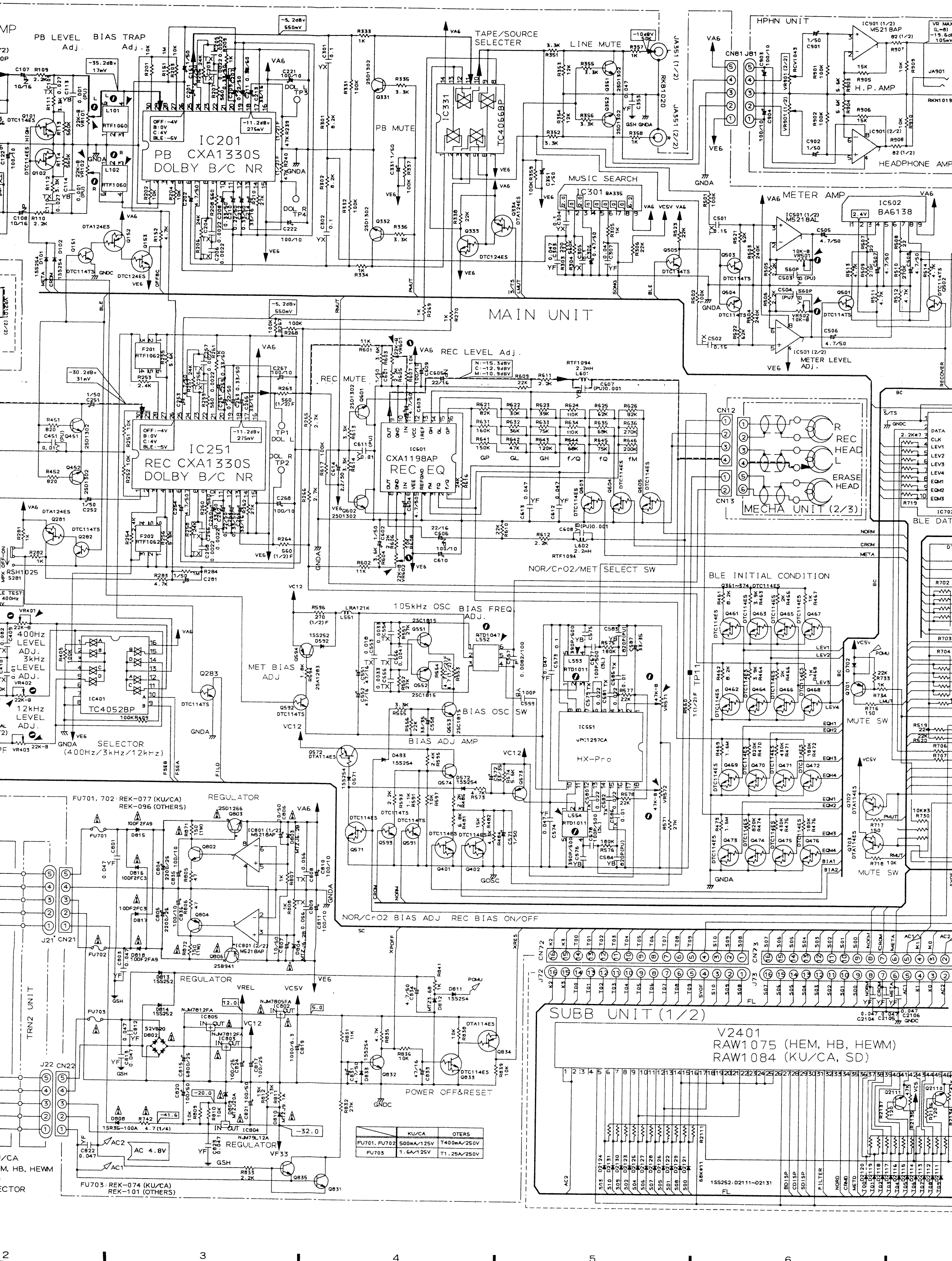

| P.C.B. pattern diagram indication | Corresponding part symbol | Part name |
|---|---|---|
| | | Transistor |
| | | FET |
| | | Diode |
| | | Zenner diode |
| | | LED |
| | | Varactor |
| | | Tact switch |
| | | Inductor |
| | | Coil |
| | | Transformer |
| | | Filter |
| | | Ceramic capacitor |
| | | Mylar capacitor |
| | | Styrol capacitor |
| | | Electrolytic capacitor (Non polarized) |
| | | Electrolytic capacitor (Noiseless) |
| | | Electrolytic capacitor (Polarized) |
| | | Electrolytic capacitor (Polarized) |
| | | Power capacitor |
| | | Semi-fixed resistor |
| | | Resistor array |
| | | Resistor |
| | | Resonator |
| | | Thermistor |

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

# 5. SCHEMATIC DIAGRAM



# AM


MAIN UNIT
IC201
PB CXA1330S
DOLBY B/C NR
IC251
REC CXA1330S
DOLBY B/C NR
IC601
CXA1198AP
REC EQ
IC331
TC4066BP
IC301 BA335
IC401
TC4052BP
IC551
μPC1297CA
HX-Pro
IC901 (1/2)
M5218AP
IC901 (2/2)
M5218AP
IC501 (1/2)
M5218AL
IC502
BA6138
IC501 (2/2)
METER LEVEL ADJ.
IC801 (1/2)
M5218AP
IC801 (2/2)
M5218AP
IC802
NJM7805FA
IC803
NJM7812FA
IC804
NJM79L12A
IC805
NJM7812FA
PB LEVEL Adj.
BIAS TRAP Adj.
TAPE/SOURCE SELECTER
LINE MUTE
PB MUTE
MUSIC SEARCH
REC MUTE
REC LEVEL Adj.
HPHN UNIT
H.P. AMP
HEADPHONE AMP
METER AMP
MUTE SW
400Hz LEVEL ADJ.
3kHz LEVEL ADJ.
12kHz LEVEL ADJ.
SELECTOR (400Hz/3kHz/12kHz)
MET BIAS ADJ
105kHz OSC BIAS FREQ ADJ.
BIAS OSC SW
BIAS ADJ AMP
NOR/CrO2/MET SELECT SW
BLE INITIAL CONDITION
REGULATOR
POWER OFF&RESET
REC HEAD L
ERASE HEAD
MECHA UNIT (2/3)
SUBB UNIT (1/2)
V2401
RAW1075 (HEM, HB, HEWM)
RAW1084 (KU/CA, SD)
TRN2 UNIT
FU701, 702: REK-077 (KU/CA)
REK-096 (OTHERS)
FU703: REK-074 (KU/CA)
REK-101 (OTHERS)
AC 4.8V
-5.2dBv 550mV
-35.2dBv 17mV
-11.2dBv 275mV
-30.2dBv 31mV
-10dBv 50K
OFF: -4V
B: 0V
C: 4V
BLE: -5V
N: -15.3dBV
C: -12.9dBV
M: -10.9dBV
RTF1094 2.2mH L601
RTF1094 2.2mH L602
RKB1020
RKN1019
RSH1025
JA351 (1/2)
JA351 (2/2)
JA901
CN81 J81
CN12
CN13
CN21
J21
CN22
J22
CN72
CN73
J72
J73
TP1 DOL L
TP2 DOL R
TP3 DOL L
TP4 DOL R
VA6
VE6
VC12
VC5V
VF33
GNDA
GNDC
GSH
GOSC
QSH GNDA
PMUT
RMUT
BLE
NORM
CROM
META
FL
RECOVER
S/TS
POMU
LMUT
XPOFF
XRES
SC
BDISP
CDISP
SDISP
FILTER
NORD
CRMD
METD
LEV1
LEV2
LEV3
LEV4
EQH1
EQH2
EQH3
EQH4
EQM1
EQM2
EQM3
EQM4
BIA1
BIA2
AC1
AC2
VCS
FSEB
FSEA
FILD
OFFBC
SONQ
S/TS
LMUT
VR401 400Hz LEVEL ADJ.
VR402 3kHz LEVEL ADJ.
VR403 12kHz LEVEL ADJ.
VR501 10K-B
VR502 10K-B
VR571 47K-B
VR601 22K-B
VR602 22K-B
VR701 100F2FA9
VR702 100F2FA9
VR703 S2VB20
S281 MPX OFF-ON
TEST 400Hz
REC MUTE
PB MUTE
MUSIC SEARCH
BLE INITIAL CONDITION
MUTE SW
POWER OFF&RESET
NOR/CrO2 BIAS ADJ REC BIAS ON/OFF
NOR/CrO2/MET SELECT SW
105kHz OSC BIAS FREQ ADJ.
BIAS OSC SW
BIAS ADJ AMP
METER LEVEL ADJ.
SUBB UNIT (1/2)
HEADPHONE AMP
MECHA UNIT (2/3)
TRN2 UNIT
SELECTOR (400Hz/3kHz/12kHz)
REGULATOR
KU/CA
OTERS
FU701, FU702
500mA/125V
T400mA/250V
FU703
1.6A/125V
T1.25A/250V
1SS252: D2111~D2131
68K*11
10K*3
22K*7

HPHN UNIT
HEADPHONE AMP
H.P. AMP
LINE MUTE
MUSIC SEARCH
METER AMP
METER LEVEL ADj.
REEL MOTOR DRIVE
ASSIST MOTOR DRIVE
MECHA UNIT (2/3)
BLE DATA CONVERSION
SC
BLE INITIAL CONDITION
MUTE SW
SYSTEM CONTROL
SUBB UNIT (1/2)
MECHA (3/3)
REMOCON
CD SYNCHRO
TIMS UNIT
DOOR SW
REC SW
SENSOR
FL IND DRIVER
DOLBY NR
V2401
RAW1075 (HEM, HB, HEWM)
RAW1084 (KU/CA, SD)
NOTE If the parts are not identified in the the diagram, the followings are used.
2SC1740S
2SA933S
1SS254
PLAYBACK SIGNAL
RECORDING SIGNAL
CT-676総合回路図

5. SWITCHES (Underline indicates switch position)

TIMS UNIT

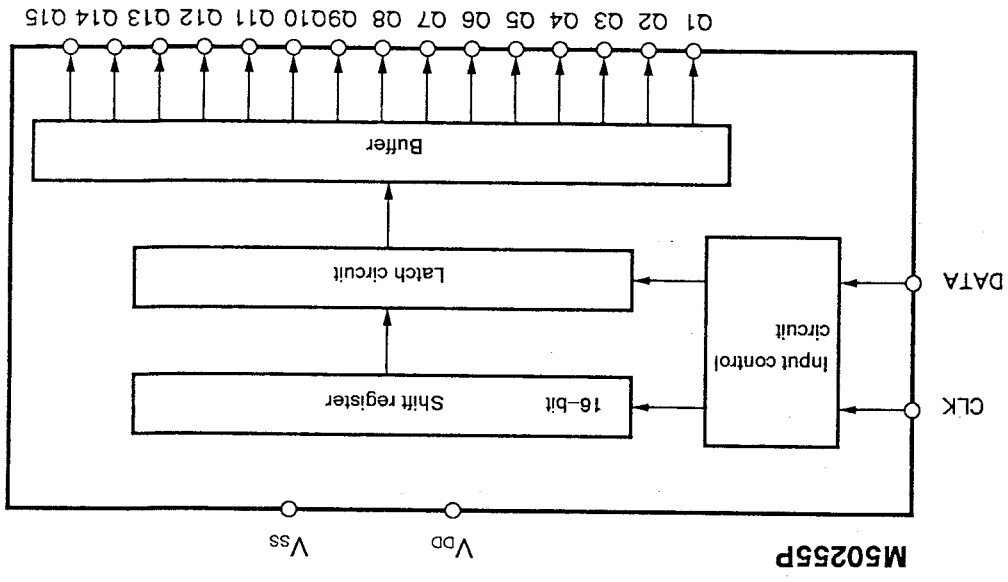
S981 : PLAY – OFF – REC

PWSW UNIT

S991 : ON – OFF

SUBB UNIT

S2101 : REW
S2102 : STOP
S2103 : PLAY
S2104 : FF
S2105 : DOOR OPEN/CLOSE
S2106 : RETURN
S2107 : COUNTER MODE
S2108 : COUNTER RESET
S2109 : METER RANGE
S2110 : HOLD MODE
S2111 : DISP OFF
S2112 : MONITOR
S2113 : MUTE
S2114 : PAUSE
S2115 : REC
S2116 : BLE
S2117 : CD – SYNCRO
S2118 : DOLBY B – OFF – C






# 6. P.C.B's PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10¹ → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4SR 5 6 2 1 F

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | | **SUBB UNIT** | |
| | | **SEMICONDUCTORS** | |
| | Q2101 | TRANSISTOR | 2SA933S |
| | Q2102 | TRANSISTOR | DTC124ES |
| | Q2103 | TRANSISTOR | DTA124ES |
| | Q2104 | TRANSISTOR | DTC124ES |
| | Q2105 | TRANSISTOR | DTA124ES |
| | Q2106 | TRANSISTOR | DTC124ES |
| | Q2107 | TRANSISTOR | DTA124ES |
| | Q2108, 2109 | DIGITAL TRANSISTOR | DTA114ES |
| | Q2110, 2111 | TRANSISTOR | 2SC1740S |
| | D2101-2131 | DIODE | 1SS252 |
| | D2222-2224 | DIODE | 1SS252 |
| | | **SWITCHES** | |
| | S2101-2115 | | RSG1039 |
| | S2116 | SWITCH | RSG1027 |
| | S2117 | | RSG1039 |
| | S2118 | | RSB1001 |
| | | **CAPACITORS** | |
| | C2101, 2102 | AXIAL CAPACITOR | CKPUYB821K50 |
| | C2104-2106 | CERAMIC CAPACITOR | CKCYF473Z50 |
| | C2107 | CERAMIC CAPACITOR | CKCYF103Z50 |
| | | **RESISTORS** | |
| | R2101 | RESISTOR ARRAY 100K | RA5T□□□J |
| | R2102-2105 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R2111 | RESISTOR ARRAY (68K) | RA11T□□□J |
| | R2112 | RESISTOR ARRAY(100K) | RA10T□□□J |
| | R2121, 2122 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R2124-2127 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R2131-2137 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | VR2101 | VARIABLE RESISTOR(100K) | RCV1077 |
| | VR2102 | VARIABLE RESISTOR(200K) | RCV1046 |
| | | **OTHERS** | |
| | V2101 | | RAV1084 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | | **REC SW UNIT** | |
| | | **SWITCHES** | |
| | S3 | SWITCH | RSG-143 |
| | | **TAPE SELECTOR UNIT** | |
| | | **SWITCHES** | |
| | S1, 2 | | RSH-070 |
| | | **SENSOR UNIT (A)** | |
| | | **SEMICONDUCTORS** | |
| | D1 | | GP1A51HR |
| | | **CAPACITORS** | |
| | C2 | CERAMIC CAPACITOR | CKPUYY103N16 |
| | | **RESISTORS** | |
| | R2 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | | **DOOR SW UNIT** | |
| | | **SWITCHES** | |
| | S4 | | RSK1002 |
| | | **HPHN UNIT** | |
| | | **SEMICONDUCTORS** | |
| | IC901 | OP-AMP, IC | M5218AP |
| | | **CAPACITORS** | |
| | C901, 902 | ELECTR. CAPACITOR | CEAS010M50 |
| | C903, 904 | ELECTR. CAPACITOR | CEAS101M10 |
| | | **RESISTORS** | |
| | R901-906 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R907, 908 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R909, 910 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | VR901 | VARIABLE RESISTOR(20K) | RCV1043 |
| | | **OTHERS** | |
| | JA901 | JACK | RKN1019 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | | **PWSW UNIT** | |
| | | **SWITCHES** | |
| ⚠ | S991 | SWITCH | RSA-063 |
| | | **CAPACITORS** | |
| ⚠ | C991 | CAPACITOR (0.01) | RCG-009 |
| | | **TIMS UNIT** | |
| | | **SWITCHES** | |
| | S981 | | RSH1011 |
| | | **MAIN UNIT** | |
| | | **SEMICONDUCTORS** | |
| | IC101 | OP-AMP-IC | M5220P |
| | IC201 | DOLBY B/C IC | CXA1330S |
| | IC251 | DOLBY B/C IC | CXA1330S |
| | IC301 | IC | BA335 |
| | IC331 | LOGIC IC | TC4066BP |
| | IC401 | LOGIC IC | TC4052BP |
| | IC402 | OP-AMP, IC | M5218AL |
| | IC501 | OP-AMP, IC | M5218AL |
| | IC502 | | BA6138 |
| | IC503 | CMOS LOGIC IC | TC4050BP |
| | IC504 | DUAL-COMPARATOR IC | M5233L |
| | IC551 | DOLBY HX PRO IC | UPC1297CA |
| | IC601 | REC EQUALIZER IC | CXA1198AP |
| | IC701 | MCU | PD4312A |
| | IC702 | OUTPUT EXPANDER IC | M50255P |
| | IC801 | OP-AMP, IC | M5218AP |
| ⚠ | IC802 | REGULATOR IC | NJM7805FA |
| ⚠ | IC803 | REGULATOR IC | NJM7812FA |
| ⚠ | IC804 | REGULATOR IC | NJM79L12A |
| ⚠ | IC805 | REGULATOR IC | NJM7812FA |
| | IC851 | LINEAR IC | TA7291P |
| | IC852 | | LB1641 |
| | Q101, 102 | TRANSISTOR | DTC114ES |
| | Q151 | DIGITAL TRANSISTOR | DTC114TS |
| | Q152 | TRANSISTOR | DTA124ES |
| | Q153 | TRANSISTOR | DTC124ES |
| | Q281 | TRANSISTOR | DTA124ES |
| | Q282, 283 | DIGITAL TRANSISTOR | DTC114TS |
| | Q331, 332 | TRANSISTOR | 2SD1302 |
| | Q333 | TRANSISTOR | DTC124ES |
| | Q334 | TRANSISTOR | DTA124ES |
| | Q351, 352 | TRANSISTOR | 2SD1302 |
| | Q401, 402 | TRANSISTOR | DTC114ES |
| | Q451, 452 | TRANSISTOR | 2SD1302 |
| | Q461-476 | TRANSISTOR | DTC114ES |
| | Q501-505 | DIGITAL TRANSISTOR | DTC114TS |
| | Q551-553 | TRANSISTOR | 2SC1815 |
| | Q571 | TRANSISTOR | DTC114ES |
| | Q572 | DIGITAL TRANSISTOR | DTA114ES |
| | Q573 | TRANSISTOR | 2SA933S |
| | Q574 | TRANSISTOR | 2SC1740S |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | | Q591-593 DIGITAL TRANSISTOR | DTC114TS |
| | | Q594 TRANSISTOR | 2SA1283 |
| | | Q601, 602 TRANSISTOR | 2SD1302 |
| | | Q603-605 TRANSISTOR | DTC114ES |
| | | Q701 TRANSISTOR | 2SA933S |
| | | Q702, 703 DIGITAL TRANSISTOR | DTA114ES |
| | | Q705-708 DIGITAL TRANSISTOR | DTA114ES |
| | | Q709-712 TRANSISTOR | DTC114ES |
| | | Q714 TRANSISTOR | DTC114ES |
| | | Q802 TRANSISTOR | 2SC1740S |
| ⚠ | | Q803 TRANSISTOR | 2SD1266 |
| | | Q804 TRANSISTOR | 2SA933S |
| ⚠ | | Q806 TRANSISTOR | 2SB941 |
| | | Q831, 832 TRANSISTOR | 2SC1740S |
| | | Q833 TRANSISTOR | DTC114ES |
| | | Q834 DIGITAL TRANSISTOR | DTA114ES |
| | | Q835 TRANSISTOR | 2SC1740S |
| | | Q851 DIGITAL TRANSISTOR | DTC114TS |
| | | Q852, 853 TRANSISTOR | 2SA933S |
| | | Q854 TRANSISTOR | DTC114ES |
| | | Q855 TRANSISTOR | 2SC1740S |
| | | Q856 DIGITAL TRANSISTOR | DTC114TS |
| | | D501-505 DIODE | 1SS254 |
| | | D571, 572 DIODE | 1SS254 |
| | | D592 DIODE | 1SS252 |
| | | D701 ZENER DIODE | MTZJ9.1A |
| | | D702 DIODE | 1SS254 |
| | | D703-706 DIODE | 1SS252 |
| | | D707-713 DIODE | 1SS254 |
| | | D720 ZENER DIODE | MTZJ3.3B |
| ⚠ | | D802 | S2VB20 |
| ⚠ | | D803, 804 ZENER DIODE | MTZJ6.2B |
| ⚠ | | D808 RECTIFIER DIODE | 1SR35-100A |
| ⚠ | | D809 ZENER DIODE | MTZJ20A |
| ⚠ | | D810 ZENER DIODE | MTZJ9.1A |
| | | D811 DIODE | 1SS254 |
| | | D812 ZENER DIODE | MTZJ3.6B |
| | | D813, 814 DIODE | 1SS252 |
| ⚠ | | D815 DIODE | 1ODF2FA9 |
| ⚠ | | D816 DIODE | 1ODF2FC3 |
| ⚠ | | D817 DIODE | 1ODF2FC3 |
| ⚠ | | D818 DIODE | 1ODF2FA9 |
| | | D833 DIODE | 1SS254 |
| | | D851 DIODE | 1SS254 |
| | | D852-856 DIODE | 1SS252 |
| | | D857 ZENER DIODE | MTZJ4.3B |
| | | D858 DIODE | 1SS254 |
| | | D860 ZENER DIODE | MTZJ11B |
| | | D861 DIODE | 1SS254 |
| | | **SWITCHES** | |
| | | S281 | RSH102S |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | | C101, 102 PL. STYRENE CAPACITOR | CQSP271J50 |
| | | C103, 104 AXIAL CAPACITOR | CKPUYB101K50 |
| | | C105, 106 AUDIO FILM CAPACITOR | CFTXA563J50 |
| | | C107, 108 ELECTR. CAPACITOR | CEANP100M16 |
| | | C109, 110 AUDIO FILM CAPACITOR | CFTXA273J50 |
| | | C113, 114 CERAMIC CAPACITOR | CKPUYB102K50 |
| | | C121, 122 ELECTR. CAPACITOR | CEAS101M10 |
| | | C151 ELECTR. CAPACITOR | CEAS010M50 |
| | | C201, 202 ELECTR. CAPACITOR | CEYA4R7M50 |
| | | C203-206 AUDIO FILM CAPACITOR | CFTXA223J50 |
| | | C207, 208 ELECTR. CAPACITOR | CEASR33M50 |
| | | C209, 210 ELECTR. CAPACITOR | CEASR22M50 |
| | | C211, 212 ELECTR. CAPACITOR | CEASR33M50 |
| | | C213, 214 ELECTR. CAPACITOR | CEAS330M16 |
| | | C221, 222 ELECTR. CAPACITOR | CEAS101M10 |
| | | C251, 252 ELECTR. CAPACITOR | CEYA010M50 |
| | | C253, 254 ELECTR. CAPACITOR | CEAS4R7M50 |
| | | C255-258 AUDIO FILM CAPACITOR | CFTXA222J50 |
| | | C259, 260 ELECTR. CAPACITOR | CEASR33M50 |
| | | C261, 262 ELECTR. CAPACITOR | CEASR22M50 |
| | | C263, 264 ELECTR. CAPACITOR | CEASR33M50 |
| | | C265, 266 ELECTR. CAPACITOR | CEYA330M16 |
| | | C267, 268 ELECTR. CAPACITOR | CEAS101M10 |
| | | C281 ELECTR. CAPACITOR | CEAS010M50 |
| | | C301, 302 CERAMIC CAPACITOR | CGCYX104K2S |
| | | C303 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C304, 305 CERAMIC CAPACITOR | CGCYX104K2S |
| | | C306 ELECTR. CAPACITOR | CEASR47M50 |
| | | C307 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C331 ELECTR. CAPACITOR | CEAS010M50 |
| | | C351 ELECTR. CAPACITOR | CEAS010M50 |
| | | C352, 353 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C381, 382 AXIAL CAPACITOR | CKPUYB101K50 |
| | | C401 ELECTR. CAPACITOR | CEAS010M50 |
| | | C402 AUDIO FILM CAPACITOR | CFTXA103J50 |
| | | C403 AUDIO FILM CAPACITOR | CFTXA104J50 |
| | | C405 AUDIO FILM CAPACITOR | CFTXA182J50 |
| | | C406 AUDIO FILM CAPACITOR | CFTXA123J50 |
| | | C408 | CFTXA272J50 |
| | | C409 AUDIO FILM CAPACITOR | CFTXA823J50 |
| | | C410 AUDIO FILM CAPACITOR | CFTXA103J50 |
| | | C451 CERAMIC CAPACITOR | CKPUYY103N16 |
| | | C501, 502 AUDIO FILM CAPACITOR | CFTXA154J50 |
| | | C503, 504 AXIAL CAPACITOR | CKPUYB561K50 |
| | | C505-508 ELECTR. CAPACITOR | CEAS4R7M50 |
| | | **COILS/TRANSFORMERS** | |
| | | L101, 102 COIL | RTF1060 |
| | | L551 RADIAL INDUCTOR | LRA121K |
| | | L552 COIL | RTD1047 |
| | | L553, 554 | RTD1011 |
| | | L601, 602 COIL | RTF1094 |
| | | L851 | RTF1068 |
| | | F201, 202 FILTER | RTF1062 |
| | | **CAPACITORS** | |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | | C509 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C551, 552 ELECTR. CAPACITOR | CEAS470M16 |
| | | C553 AUDIO FILM CAPACITOR | CFTXA183J50 |
| | | C554, 555 AUDIO FILM CAPACITOR | CFTXA332J50 |
| | | C556 AUDIO FILM CAPACITOR | CFTXA472J50 |
| | | C557 PL. PROPYTENE CAPACITOR | CQPA822J100 |
| | | C558 ELECTR. CAPACITOR | CEAS330M35 |
| | | C559 AXIAL CAPACITOR | CKPUYB101K50 |
| | | C571 ELECTR. CAPACITOR | CEAS010M50 |
| | | C572 ELECTR. CAPACITOR | CEAS330M35 |
| | | C573, 574 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C575, 576 CERAMIC CAPACITOR | CKCYB391K500 |
| | | C577, 578 CERAMIC CAPACITOR | CCCSL101K500 |
| | | C579-582 AUDIO FILM CAPACITOR | CFTXA223J50 |
| | | C583, 584 AXIAL CAPACITOR | CKPUYB821K50 |
| | | C585, 586 AUDIO FILM CAPACITOR | CFTXA103J50 |
| | | C587 ELECTR. CAPACITOR | CEAS330M35 |
| | | C601, 602 ELECTR. CAPACITOR | CEAS010M50 |
| | | C603, 604 ELECTR. CAPACITOR | CEAS4R7M50 |
| | | C605, 606 ELECTR. CAPACITOR | CEANP220M16 |
| | | C607, 608 CERAMIC CAPACITOR | CKPUYB102K50 |
| | | C609, 610 ELECTR. CAPACITOR | CEAS101M10 |
| | | C611 CERAMIC CAPACITOR | CKPUYY103N16 |
| | | C612, 613 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C614 ELECTR. CAPACITOR | CEAS22M50 |
| | | C701 ELECTR. CAPACITOR | CEAS101M10 |
| | | C702-704 CERAMIC CAPACITOR | CKCYF103Z50 |
| | | C706, 707 CERAMIC CAPACITOR | CKCYF103Z50 |
| | | C708 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C721 ELECTR. CAPACITOR | CEAS470M16 |
| | | C722 CERAMIC CAPACITOR | CKCYF103Z50 |
| | | C801 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C803 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C804, 805 ELECTR. CAPACITOR | CENA222M25 |
| | | C806, 807 ELECTR. CAPACITOR | CEAS100M50 |
| | | C808, 809 AUDIO FILM CAPACITOR | CFTXA563J50 |
| | | C810, 811 ELECTR. CAPACITOR | CEAS101M10 |
| | | C812, 813 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C815 CAPACITOR (6800/2S) | YCH1078 |
| | | C817 ELECTR. CAPACITOR | CEAS101M25 |
| | | C819 ELECTR. CAPACITOR | CEAS102M6R3 |
| | | C820, 821 ELECTR. CAPACITOR | CEAS101M50 |
| | | C822, 823 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C824 ELECTR. CAPACITOR | CEAS101M25 |
| | | C831 ELECTR. CAPACITOR | CEAS4R7M50 |
| | | C833 ELECTR. CAPACITOR | CEAS470M16 |
| | | C834 ELECTR. CAPACITOR | CEAS4R7M50 |
| | | C835, 836 ELECTR. CAPACITOR | CEAS101M10 |
| | | C851, 852 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C853, 854 ELECTR. CAPACITOR | CEAS100M50 |
| | | C855 ELECTR. CAPACITOR | CEAS220M25 |
| | | C856 CERAMIC CAPACITOR | CKCYF473Z50 |
| | | C861 CERAMIC CAPACITOR | CKCYF473Z50 |

1. RESISTORS :
   Indicated in Ω, 1/6W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2. CAPACITORS :
   Indicated in capacity (μF) / voltage (V) unless otherwise noted p ; pF.
   Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT :
   ; DC voltage (V) at no input signal.
   ⬅mA ; DC current at no input signal.

4. OTHERS :
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

| Mark | No. | Description | Part No. |
|---|---|---|---|
| **RESISTORS** | | | |
| | R101-114 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R151, 152 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R201-210 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R239, 240 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R251-262 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R263, 264 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R265-270 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R281-284 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R301-306 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R331-338 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R351-359 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R401-412 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R451, 452 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R461-476 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R481, 482 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R484, 485 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R501-514 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R515 | RESISTOR ARRAY (22K) | RA5T□□□J |
| | R516 | LADDER RESISTOR(11K) | RCX1020 |
| | R517-523 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R551, 552 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R553, 554 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R555, 556 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R560 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R571 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R573-578 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R591 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R593-595 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R596 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R597 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R601-614 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R616, 617 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R621-626 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R631-636 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R641-646 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R702 | RESISTOR ARRAY (10K) | RA4T□□□J |
| | R703 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R704 | RESISTOR ARRAY (10K) | RA4T□□□J |
| | R705-708 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R710-714 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R716-718 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R719 | RESISTOR ARRAY(2.2K) | RA7T□□□J |
| | R720 | RESISTOR ARRAY (2.2K) | RA5T□□□J |
| | R722-726 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R729 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R730 | RESISTOR ARRAY 10K | RA3T□□□J |
| | R731-734 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| ⚠ | R742 | FUSLIBLE RESISTOR | RFA1/4L□□□J |
| | R805-812 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R831-833 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R835, 836 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R838, 839 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R841 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R851-866 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| | R867 | CARBONFILM RESISTOR | RD1/2LF□□□J |
| | R868-870 | CARBONFILM RESISTOR | RD1/6PM□□□J |
| ⚠ | R871, 872 | METAL OXIDE RESISTOR | RS1LMF□□□J |
| | VR101, 102 | VR(22K) | RCP1046 |
| | VR401-403 | VR(22K) | RCP1046 |
| | VR501, 502 | VR(10K) | RCP1045 |
| | VR571, 572 | VR(47K) | RCP1047 |
| | VR601, 602 | VR(22K) | RCP1046 |
| **OTHERS** | | | |
| | JA351, 352 | JACK | RKB1020 |
| | JA701, 702 | JACK | RKN1004 |
| | JA703 | JACK | RKN1014 |
| | X701 | CERAMIC RESONATOR | VSS1014 |

## CONNECTOR UNIT

| Mark | No. | Description | Part No. |
|---|---|---|---|
| **CAPACITORS** | | | |
| | C1 | CERAMIC CAPACITOR | CKCYF473Z50 |
| **RESISTORS** | | | |
| | R4, 5 | CARBONFILM RESISTOR | RD1/6PM□□□J |

## TRN 1 UNIT

There is no supply part in this unit.

## TRN 2 UNIT

There is no supply part in this unit.

# 7. ADJUSTMENTS

## 7.1 MECHANISM RELATED ADJUSTMENT

| 1. Tape Speed Adjustment | | |
|---|---|---|
| Mode | Adjustment Location | Specifications |
| PLAY | Capstan motor adjustment hole (Refer to Fig. 1.) | Adjust so that the playback frequency is 3000±5 Hz at the beginning of winding of test tape STD-301. |
| PLAY | | Playback test tape STD-301 again and confirm that the above specifications are satisfied. |

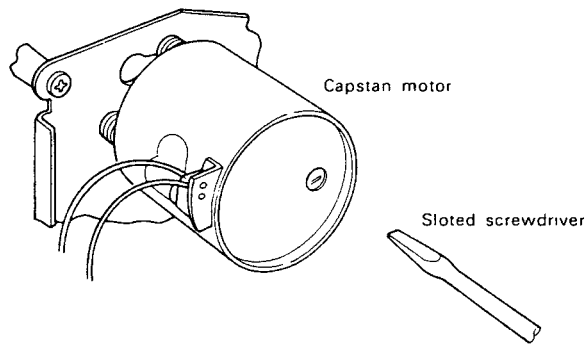



Fig. 1.

## 7.2 ELECTRICAL ADJUSTMENTS

### Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBv=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

### Test Tapes

STD-331B : Playback adjustments (See Fig. 7-1)
STD-630 : NORMAL blank tape
STD-620 : $CrO_2$ blank tape
STD-610 : METAL blank tape

### List of Adjustments

#### Playback sections

1. Head azimuth adjustment.
2. Playback level adjustment.

#### Recording sections

1. Bias oscillator adjustment.
2. Bias trap adjustment.
3. Recording bias adjustment.
4. Recording level adjustment.
5. Level meter adjustment and BLE adjustment.

NOTE: This unit has an automatic tape selection feature.

*HX Pro headroom extension originated by Bang & Olufsen and manufactured under license from Dolby Laboratories Licensing Corporation.*
*"DOLBY", the double-D symbol ◻◻ , and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

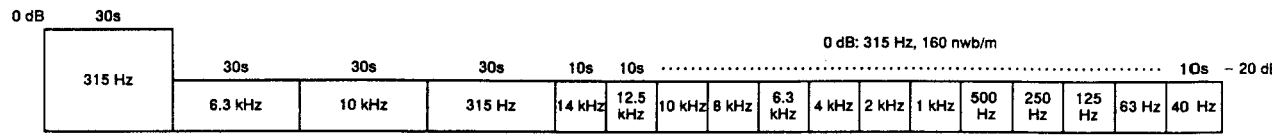



Fig. 7-1 Constants of the test tape STD-331B

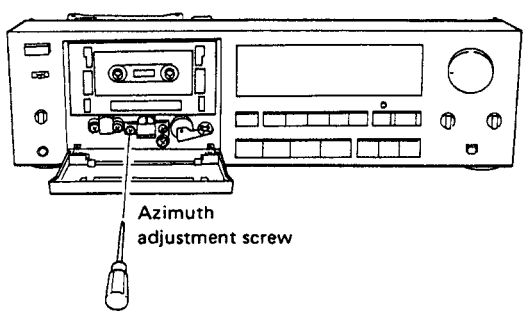



Fig. 7-2 Head azimuth adjustment

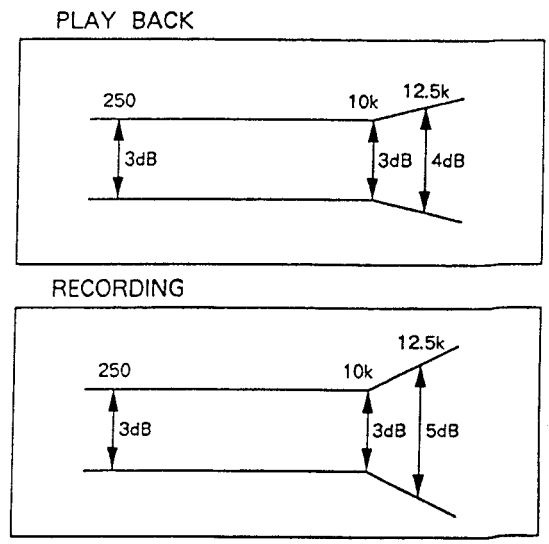



Fig. 7-3 Frequency response zone

# PLAYBACK SECTION

## 1. Head Azimuth Adjustment

- Turn VR101, 102 to mechanical center positions.

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 10 kHz/–20 dB section of STD–331B test tape. | Head azimuth adjustment screw. (See Fig. 7–2) | LINE OUT | Maximum playback signal level. | |
| 2. | STOP | Lock the screw with screw lock after completing adjustment. | | | | |

## 2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | PLAY | Play the 315 Hz/0 dB section of the STD–331B test tape. | Deck | VR101 (Lch)<br>VR102 (Rch) | TP. 3 (Lch)<br>TP. 4 (Rch) | –10.7 dBv | This adjustment must be performed accurately for proper Dolby level setting. |

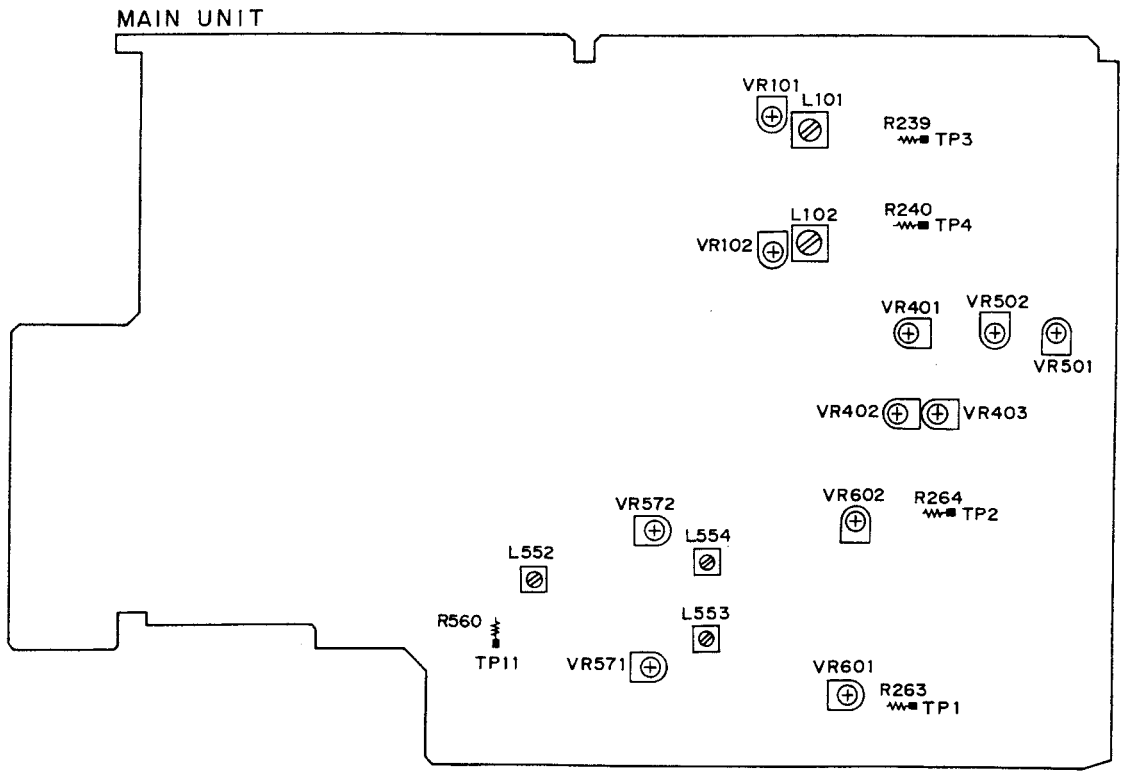



Fig. 7–4 Adjusting points

# RECORDING SECTION

## 1. Bias Oscillator Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC | Load the STD-610 test tape with no input signal. | Deck | L552 | TP. 11 | 105 kHz ± 300 Hz | |

## 2. Bias Trap Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC | Load the STD-610 test tape with no input signal. | Deck | L101 (Lch)<br>L102 (Rch) | LINE OUT | Minimum output | |

## 3. Recording Bias Adjustment

| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Apply a 315 Hz/-20 dBv (-20VU meter reading) signal to the line input terminals and insert STD-630. | | | LINE OUT | | |
| 2. | | Record and play back the 315 Hz signal and a 10 kHz signal at -20 dBv input level. | Deck | VR571 (L)<br>VR572 (R) | | Record and play back repeatedly, comparing the 315 Hz and 10 kHz playback levels, and adjust to 0 ± 0.5 dB. | |
| 3. | Check distortion value after adjustment is completed and confirm that there is no underbias. | | | | | | |

## 4. Recording Level Adjustment

- Turn ON the DOLBY NR switch.

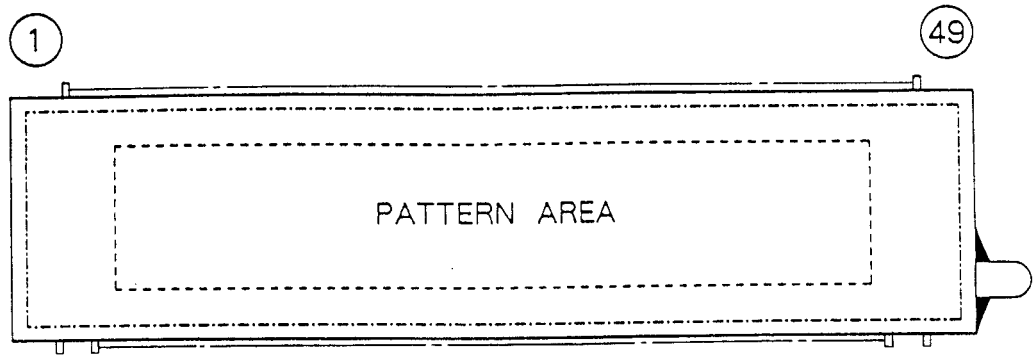
| No. | Mode | Input signal & test tape | Adjustment location | | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|---|
| 1. | REC/ PAUSE | Apply the 315 Hz/0 dBv signal to the line input, and load STD-630 (NORM). | REC level control volume | | TP. 1 (Lch)<br>TP. 2 (Rch) | -11.2 dBv | |
| 2. | REC → PLAY | Record and play back the 315 Hz/0 dBv signal. | Deck | VR601 (Lch)<br>VR602 (Rch) | TP. 3 (Lch)<br>TP. 4 (Rch) | Repeatedly record, playback and adjust so that the playback signal level becomes -11.2 dB. | Recording bias adjustment and recording level adjustment with STD-630 must be performed accurately as reference for BLE adjustment. |
| 3. | REC → PLAY | Record the 315 Hz/0 dBv signal on STD-620 (CrO2), and play it back. | Check | | | -11.2 dBv ± 1.5 dB | |
| 4. | REC → PLAY | Record the 315 Hz/0 dBv signal on STD-610 (METAL), and play it back. | Check | | | -11.2 dBv ± 1.5 dB | |

## 5. Level Meter Adjustment and BLE Adjustment

- BLE adjustment should be performed after all other adjustments are completed.
- This adjustment should be performed in the test mode.
- Entering the test mode
  Press the MODE (COUNTER), RANGE and Display ON/OFF keys on the front panel simultaneously, with the power ON. The unit enters the test mode and the following occurs:
  1. When REC key is pressed, the unit enters the test mode 1. (FL indication "1")
     At this time, level meter adjustment is to be performed.
  2. When REW key is pressed, the unit enters the test mode 2. (FL indication "2")
     At this time, BLE adjustment (400 Hz) is to be performed.
  3. When STOP key is pressed, the unit enters the test mode 3. (FL indication "3")
     At this time, BLE adjustment (3 kHz) is to be performed.
  4. When PLAY key is pressed, the unit enters the test mode 4. (FL indication "4")
     At this time, BLE adjustment (12 kHz) is to be performed.

| No. | Mode | Input signal & test tape | Adjustment location | Measuring location | Adjustment value | Remarks |
|---|---|---|---|---|---|---|
| 1. | REC PAUSE | Input the 315 Hz/–10 dBv (316 mV) signal to the LINE INPUT terminal, set to the test mode, and then press the REC key. | REC LEVEL VR | LINE OUT | –10 dBv | Level meter adjustment |
| | | | VR501 | Level meter Lch | Adjust so that 0 dB of the level meter flashes. | |
| | | | VR502 | Level meter Rch | Adjust so that 0 dB of the level meter flashes. | |
| 2. | — | REC LEVEL VR MIN or no signal input. | — | — | — | |
| 3. | | Press the REW key. | VR401 | Level meter Rch | Adjust so that 0 dB of the level meter flashes. | 400 Hz adjustment |
| 4. | | Press the STOP key. | VR402 | | Adjust so that 0 dB of the level meter flashes. | 3 kHz adjustment |
| 5. | | Press the PLAY key. | VR403 | | Adjust so that 0 dB of the level meter flashes. | 12 kHz adjustment |
| 6. | When the RESET key is pressed again, the test mode is released. | | | | | |

## • FL INFORMATION

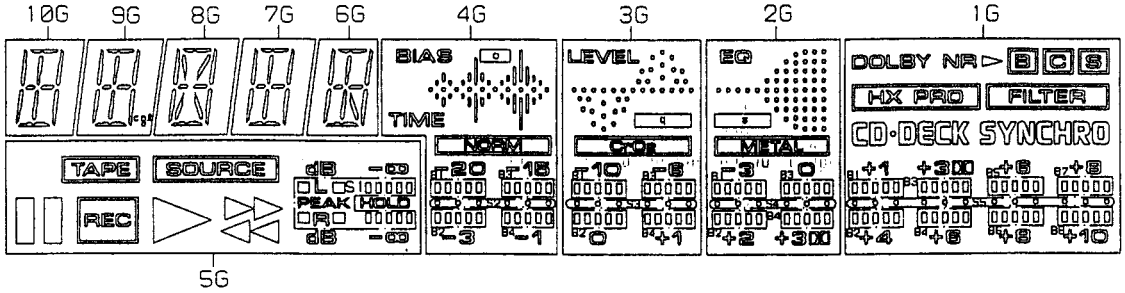


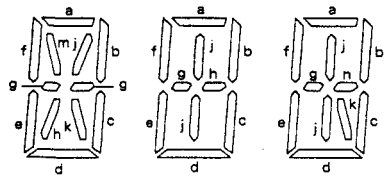

## PIN CONNECTION

| PIN NO. | 49 | 48 | 47 | 46 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | F1 | F1 | NP | 1G | 2G | 3G | 4G | 5G | 6G | 7G | 8G | 9G | 10G | P22 | P21 | P20 | P19 | P28 | P27 | P26 | P25 | P24 | P23 | P31 | P30 |

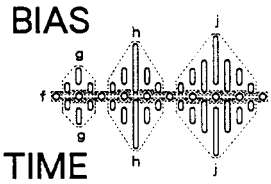
| PIN NO. | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONNECTION | P29 | NC | P18 | P17 | P16 | P15 | P14 | P13 | P1 | P9 | P2 | P6 | P8 | P7 | P5 | P3 | P10 | P11 | P4 | P12 | NP | NP | F2 | F2 |

**Note:** 1) F1, F2 ····· Filament
2) NP····· No pin
3) NC ····· No connection
4) 1G to 10G ··· Grid

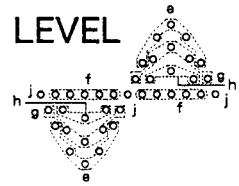


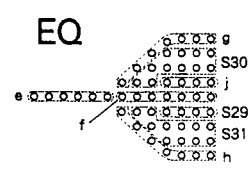
(8G) (7,9,10G) (6G)




(4G)




(3G)




(2G)

## ANODE CONNECTION

| | 10G | 9G | 8G | 7G | 6G | 5G | 4G | 3G | 2G | 1G |
|---|---|---|---|---|---|---|---|---|---|---|
| P1 | a | a | a | a | a | ▮▮ | B1 | B1 | B1 | B1 |
| P2 | b | b | b | b | b | REC | B2 | B2 | B2 | B2 |
| P3 | c | c | c | c | c | ▶ | B3 | B3 | B3 | B3 |
| P4 | d | d | d | d | d | ◀◀ | B4 | B4 | B4 | B4 |
| P5 | e | e | e | e | e | ▶▶ | TIME | e | e | B5 |
| P6 | f | f | f | f | f | – | f | f | f | B6 |
| P7 | g | g | g | g | g | TAPE | g | g | g | B7 |
| P8 | h | h | h | h | h | SOURCE | h | h | h | B8 |
| P9 | j | j | j | j | j | HOLD | j | j | j | CD·DECK SYNCHRO |
| P10 | – | – | k | – | k | dB –∞ | –20 –15 | –10 –6 | –3 0 | +1 +3 +6 +8 |
| P11 | – | o (col) | m | – | – | dB –∞ | –3 –1 | 0 +1 | +2 +3 | +4 +6 +8 +10 |
| P12 | – | – | – | – | – | – | S2 | S3 | S4 | S5 |
| P13 | – | – | – | – | – | S1 | – | – | – | – |
| P14 | – | – | – | – | – | – | BIAS | – | – | – |
| P15 | – | – | – | – | – | – | o | – | – | – |
| P16 | – | – | – | – | – | – | – | LEVEL | – | – |
| P17 | – | – | – | – | – | – | – | q | – | – |
| P18 | – | – | – | – | – | – | – | – | EQ | – |
| P19 | – | – | – | – | – | – | – | – | s | – |
| P20 | – | – | – | – | – | – | NORM | – | – | – |
| P21 | – | – | – | – | – | – | – | $CrO_2$ | – | – |
| P22 | – | – | – | – | – | – | – | – | METAL | – |
| P23 | – | – | – | – | – | – | – | – | – | DOLBY NR |
| P24 | – | – | – | – | – | – | – | – | – | B |
| P25 | – | – | – | – | – | – | – | – | – | C |
| P26 | – | – | – | – | – | – | – | – | – | S |
| P27 | – | – | – | – | – | – | – | – | – | HX PRO |
| P28 | – | – | – | – | – | – | – | – | – | FILTER |
| P29 | – | – | – | – | – | – | – | – | S29 | – |
| P30 | – | – | – | – | – | – | – | – | S30 | – |
| P31 | – | – | – | – | – | – | – | – | S31 | – |

# 8. FOR CT–676/HEM, HB, SD AND CT–676–S/HEWM TYPES

## CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

**The CT–676/HEM, HB, SD and CT–676–S/HEWM types are the same as the CT–S709/KU/CA type with the exception of the following sections.**

| Mark | Symbol & Description | Part No. | | | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | CT–S709/ KU/CA type | CT–676/ HEM type | CT–676/ HB type | CT–676/ SD type | CT–676–S/ HEWM type | |
| | SUBB unit | Non supply | Non supply | Non supply | Non supply | Non supply | |
| ⚠ | Strain relief | CM–22C | CM–22B | CM–22B | CM–22B | CM–22B | |
| ⚠ | AC Power cord | PDG1015 | PDG1003 | PDG1036 | PDG1013 | PDG1003 | |
| ⚠ | FU701, FU702 Fuse (500mA) | REK–077 | ..... | ..... | ..... | ..... | |
| ⚠ | FU703 Fuse (1.6A) | REK–074 | ..... | ..... | ..... | ..... | |
| ⚠ | FU701, FU702 Fuse (400mA) | ..... | REK–096 | REK–096 | REK–096 | REK–096 | |
| ⚠ | FU703 Fuse (1.25A) | ..... | REK–101 | REK–101 | REK–101 | REK–101 | |
| ⚠ | Power transformer (AC120V) | RTT1159 | ..... | ..... | ..... | ..... | |
| ⚠ | Power transformer (AC220–230/230–240V) | ..... | RTT1160 | RTT1160 | ..... | RTT1160 | |
| ⚠ | Power transformer (AC110/120–127/220/240V) | ..... | ..... | ..... | RTT1173 | ..... | |
| ⚠ | Voltage selector | ..... | ..... | ..... | PSB1002 | ..... | |
| | FL filter | RAH1838 | RAH1542 | RAH1542 | RAH1838 | RAH1542 | |
| | Power button | RAC1410 | RAC1410 | RAC1410 | RAC1410 | RAC1503 | |
| | Function knob | RAC1411 | RAC1411 | RAC1411 | RAC1411 | RAC1502 | |
| | Push knob | RAC1413 | RAC1413 | RAC1413 | RAC1413 | RAC1505 | |
| | Knob (B) | RAC1414 | RAC1414 | RAC1414 | RAC1414 | RAC1492 | |
| | VR knob | ..... | ..... | ..... | ..... | RAC1496 | |
| | Mode knob | RAC1552 | RAC1552 | RAC1552 | RAC1552 | RAC1611 | |
| | Slide SW knob | RAC1562 | RAC1562 | RAC1562 | RAC1562 | RAC1522 | |
| | Door | RAH1846 | RAH1846 | RAH1846 | RAH1846 | RAH1847 | |
| | Side rubber | REB1094 | REB1094 | REB1094 | REB1094 | REB1128 | |
| | Panel stay | RNT1090 | RNT1090 | RNT1090 | RNT1090 | RNT1110 | |
| | VR knob assembly (A) | RXA1281 | RXA1281 | RXA1281 | RXA1281 | ..... | |
| | Bonnet | RXX1378 | RXX1378 | RXX1378 | RXX1378 | RXX1379 | |
| | Front panel assembly | RXX1388 | RXX1387 | RXX1387 | RXX1387 | RXX1389 | |
| | Packing case | RHG1282 | RHG1281 | RHG1281 | RHG1281 | RHG1283 | |
| | Operating instructions (English) | RRB1094 | ..... | RRB1094 | RRB1094 | ..... | |
| | Operating instructions (French, Italian, Dutch, Swedish, Spanish, Portuguese) | ..... | RRD1110 | ..... | ..... | ..... | |
| | Operating instructions (English, German) | ..... | RRE1045 | ..... | ..... | RRE1045 | |

## SUBB UNIT

**The SUBB units (for CT–676/HEM, HB and CT–676–S/HEWM types) are the same as the SUBB unit (for CT–S709/KU/CA and SD types) with the exception of the following sections.**

| Mark | Symbol & Description | Part No. | | Remarks |
|---|---|---|---|---|
| | | CT–S709/ KU/CA, SD types | CT–676/HEM, HB and CT–676–S/ HEWM types | |
| | R2131, R2132<br>V2101 FL tube | RD1/6PM302J<br>RAW1084 | RD1/6PM273J<br>RAW1075 | |

# 9. SPECIFICATIONS

System ..... 4 track, 2-channel stereo
Heads
Recording and playback head:
Combined Hard permalloy recording/Hard permalloy playback head × 1
Erasing head: Ferrite head × 1
Motor ..... DC servo capstan motor × 1
DC reel motor × 1
DC assist motor × 1
Wow and Flutter
No more than 0.027% (WRMS)
No more than ±0.065% (DIN)
Fast Winding Time (C-60 tape)
Approximately 90 seconds
Frequency Response (−20 dB recording, ±6 dB)
Metal tape ..... 15 to 21,000 Hz
Chrome tape ..... 15 to 20,000 Hz
Normal tape ..... 15 to 20,000 Hz
Signal-to-Noise Ratio (Dolby NR off)
More than 60 dB
Noise Reduction Effect
Dolby B-type NR ON ..... More than 10 dB (at 5 kHz)
Dolby C-type NR ON ..... More than 19 dB (at 5 kHz)
Harmonic Distortion ..... No more than 0.6% (0 dB)
Input (Sensitivity)
LINE (INPUT)
63 mV (Input impedance 54 kΩ)
Output (Reference level)
LINE (OUTPUT)
316 mV (Output impedance 3.2 kΩ)
Headphone
(Load impedance 8 Ω, PHONES LEVEL control max.)
1.3 mW

## Subfunctions

- Super AUTO BLE system
- Dolby HX Pro Headroom Extension system
- Dolby B-type and C-type noise reduction systems
- MPX filter
- Level meter with 2 modes peak hold selection
  10 +1 segments
- Level meter range selection (wide/expanded)
- 4-digit electronic tape counter with mode selection
  Normal/Time
- Auto monitor selection (Tape/Source)
- Display off
- Music search (over ±15 selections)
- Automatic Tape Loose Canceller (ATLC)
- Tape return/Return play
- Auto space recording mute
- Auto tape selector
- Playback/recording timer start function
- CD•DECK SYNCHRO recording
- Headphones jack with level control
- Power eject (Open/Close)
- Repeat playback
- System remote control available

## Miscellaneous

Power Requirements
U.S., Canadian model ..... AC 120 V, 60 Hz
U.K. model ..... AC 230−240 Volts~, 50/60 Hz
Multi-voltage model ..... AC 110/120−127/220/240 V (switchable), 50/60 Hz

Power Consumption

| | U.S. Canadian | U.K. | Multi-voltage |
|---|---|---|---|
| CT-S709 | 21 W | – | – |

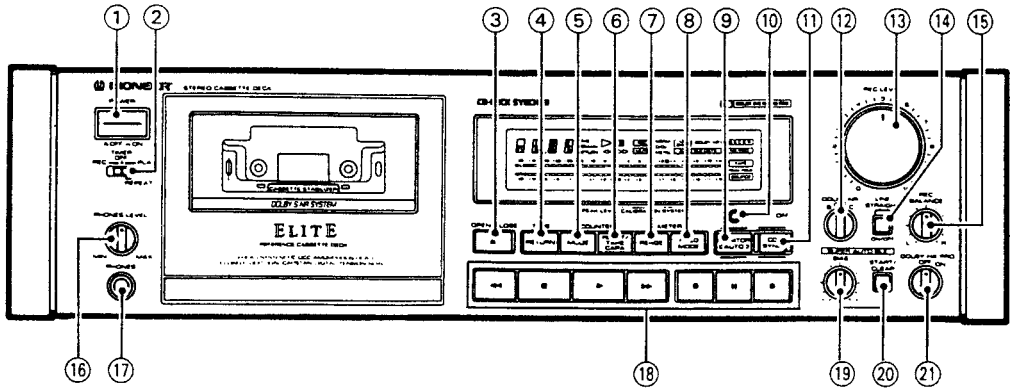
Dimensions
420(W) × 130.5(H) × 323(D) mm
16-9/16(W) × 5-1/8(H) × 12-11/16(D) in
Weight (without package)
5.8 kg (12 lb 13 oz)

## Accessories

Operating instructions ..... 1
Connection cord with pin plugs ..... 2
CD•DECK SYNCHRO control cord ..... 1
Remote control cord ..... 1

*NOTE:*
*Specifications and design subject to possible modifications without notice, due to improvements.*

# 10. PANEL FACILITIES




① **Power switch (POWER ■ OFF/▬ ON)**

② **Timer mode/repeat play switch (TIMER REC/OFF/PLAY-REPEAT)**

③ **Open/close button (OPEN/CLOSE ⏏)**

Press this button to open or close the cassette door. Whenever inserting or removing a cassette tape, be sure that the power is turned ON.

*NOTE:*

*If the cassette door is closed while the unit is turned OFF, and the power is then turned ON, the cassette door may open and close after pressing one of the operation buttons. This occurs when the microprocessor resets the door mechanism to its initial state and does not indicate any malfunctioning of the unit.*

④ **Tape return button (TAPE RETURN)**

This button is used in the normal tape counter mode to fast forward or rewind the tape to a point near the counter reading "0000."

⑤ **Counter mode button (COUNTER MODE)**

Each time this button is pressed, one of the two mode (Normal tape counter/Time counter) is set in sequence.

⑥ **Counter reset button (COUNTER RESET)**

Reset the counter indication to "0000."

⑦ **Level meter range selector button (METER RANGE)**

Selects wide or expanded range for the level meter.

⑧ **Level meter hold mode button (METER HOLD MODE)**

Selects the display mode of the peak level.

When press this button so that the HOLD indicator lights up, the level meter holds the maximum level indications of the signal. To erase the maximum level indications, press this button again. When the HOLD indicator goes off, the level meter holds peak indications for about 1.2 second.

⑨ **Monitor selector button (MONITOR [AUTO])**

Used to monitor the source sound or just recorded sound during recording.

- When the unit is set to record or playback mode, the TAPE indicator light up and the monitor mode is automatically selected.

⑩ **Display off button (DISPLAY OFF)**

Press this button to turn off the function display.

⑪ **CD•DECK SYNCHRO recording button (CD SYNC)**

⑫ **DOLBY* NR switch**

3-position (B/OFF/C)

*

- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol ⧈ and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

⑬ **Recording level control (REC LEVEL)**

⑭ **Recording balance control (REC BALANCE)**

⑮ **Headphones level control (PHONES LEVEL)**

⑯ **Headphones jack (PHONES)**

⑰ **Operation buttons**

- ◀◀: Rewind/music search
- ■ : Stop
- ▶ : Playback
- ▶▶: Fast forward/music search
- ● : Recording
- ▮▮ : Pause
- O : Recording mute

⑱ **SUPER AUTO BLE button (START/CLEAR)**

## ATLC (Automatic Tape Loose Canceler)

With the tape slack prevention function, when the cassette door closes, the take-up reel automatically revolves to eliminate any tape slack.

## SUPER AUTO BLE

With commercially available cassette tapes, sensitivity and frequency characteristics might differ slightly from one another, even though the same sound adjustment is set for them. To utilize tape characteristics to the maximum possible and realize an ideal recording which reproduces the source exactly, optimum recording level (sensitivity) and equalizer values must be set accordingly for each tape. In many conventional tape decks, standard values are fixed for standard tapes, thus nullifying the subtle differences between individual tapes. Perfect tuning by ear through use of fine adjustment controllers for bias and sensitivity is difficult and requires a lot of effort.

The AUTO BLE on this unit automatically adjusts bias, level and equalizer by using a microprocessor to set the optimum recording characteristics accordingly for each tape.

### Contrast of Super AUTO BLE Tuning System

| | CT-S709 |
|---|---|
| BIAS tuning (Freq./Steps) | 12 kHz 3-step |
| LEVEL tuning (Freq./Steps) | 400 Hz 16-step |
| Mid EQ tuning (Freq./Steps) | 3 kHz 16-step |
| Hi EQ tuning (Freq./Steps) | 12 kHz 16-step |